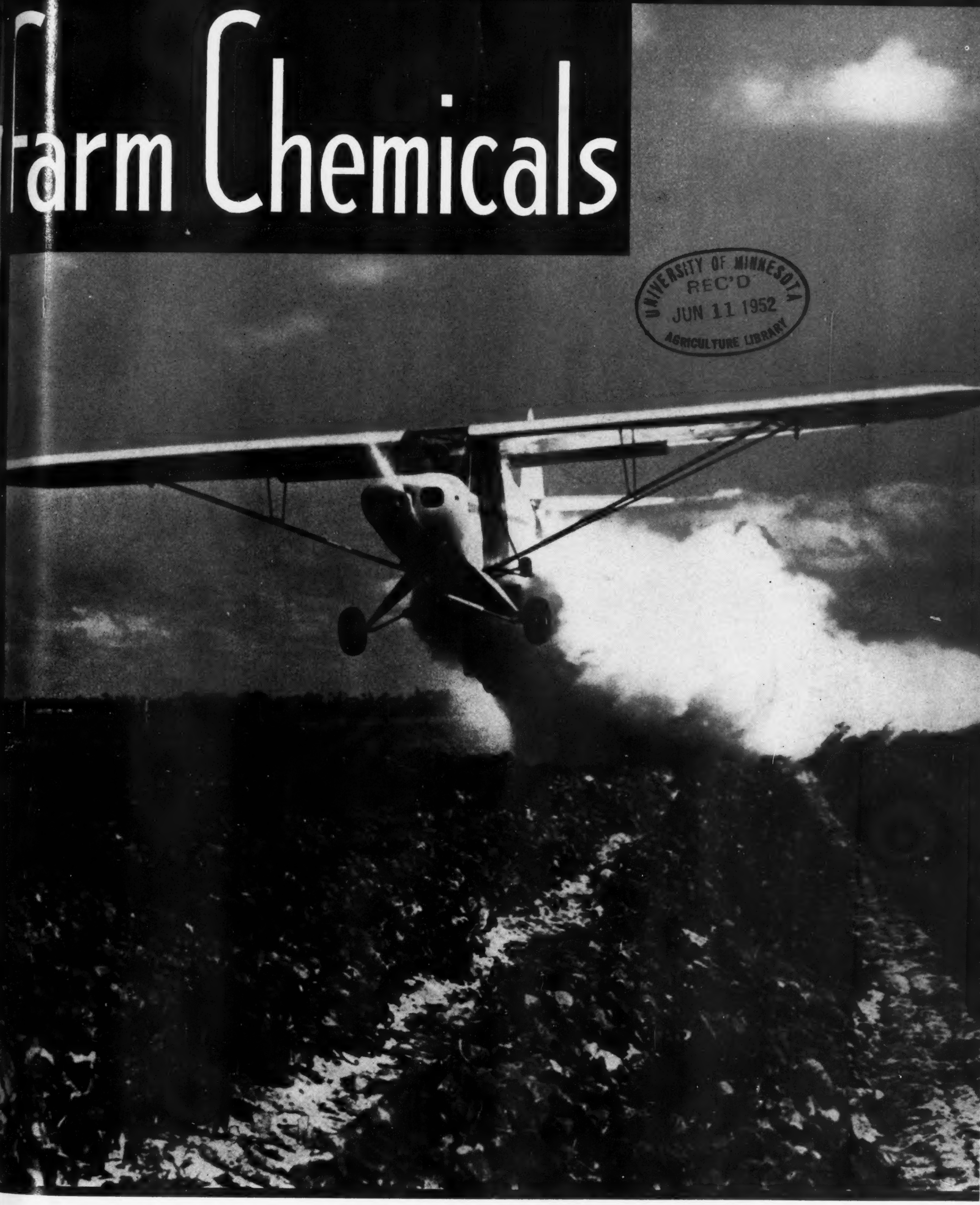
Farm Chemicals



Published monthly. Annual subscription: in the United States, $3.00; Canada and Mexico, $4.00; other countries, $5.00. Entered as second-class matter, January 15, 1910, at the Post Office at Philadelphia, Pa., under Act of March 3, 1879. Registered in United States Patent Office. Publication office, 317 N. Broad St., Phila. 7, Pa.

There's no packing or shipping problem on this packer's mind
Raymond Multi-Wall Paper Shipping Sacks take all the worries out of packing and shipping problems.
These tough, strong, dependable Shipping Sacks are made of specially prepared Kraft paper, in various types, sizes, and strengths. Printed in multicolors or plain. They are CUSTOM BUILT to your product and packing equipment.
A Raymond representative will be glad to assist you in selecting the perfect Raymond Multi-Wall Paper Shipping Sack for your needs. Wire, write, or phone Raymond today.
R
R
THE RAYMOND BAG COMPANY
Middletown, O.
The CUSTOM BUILT Fertilizer Shipping Sacks

In this issue . . .

"It's as important in its field as the discovery of penicillin was to medicine." That's the way scientists have referred to the development of Systox, claimed by Pittsburgh Agricultural Chemical company to be the first true systemic insecticide ever approved for use in the United States. For details about Systox, which is translocated throughout the treated plant and gives effective control against insects even in new growth, turn to the illustrated article on page 13. For comment on what development of Systox may mean to the industry, see the editorial on page 7.

Probably no meetings of the fertilizer industry ever have been as important as the two big conventions scheduled for this month. Facing the industry is the never-ending task of making a limited number of acres produce an ever-increasing amount of food and fiber. First on the convention schedule is the National Fertilizer Association confab set for the swank Greenbrier Hotel, White Sulphur Springs, W. Va., June 16–18. American Plant Food Council delegates will assemble at the popular Homestead, Hot Springs, Va., June 19–22 for their convention. Industry personnel won't be alone with their troubles. Helping them to untie the Gordian knot that is plaguing the farm chemicals field will be leading speakers representing agriculture, research and government. If you plan to attend either of the conventions (or even if you don't), you should be interested in the business and recreational schedules. NFA delegates, see the story on page 16; Plant Food Council members, turn to page 18.

Acid-Insoluble ash and carbonates in mixed fertilizers are surveyed in part two of our series on mixed fertilizers. Last month K. G. Clark and W. M. Hoffman, of the Bureau of Plant Industry, USDA, discussed phosphorus forms. For the concluding portion of the survey, read the article starting on page 21.

A good commentary on the rapid growth of the pesticide industry is given in I. Shyke's article on page 28. When demand for pest control chemicals increased several years ago, the Grange League Federation constructed a special micro-grinding plant in Middletown, N. Y. The construction really paid off, according to GLF officials, as production increased 500 per cent. Read the story of the GLF plant and its organization to get an insight into a typical pesticide processing unit.

There's a movement under way in Mexico for domestic production of insecticides. Agricultural officials in that country reportedly are unsatisfied with the price they have to pay for imported pesticides, primarily from the U. S. For the story on the development South of the Border, which may have serious repercussions on the industry, read the feature on the last page of this issue.

farm chemicals

Formerly
American Fertilizer & Allied Chemicals

Established 1894

PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

Vol. 115 **JUNE, 1952** **No. 6**

Contents

Cover Story

Protecting crops from the ravages of insects was aided tremendously when airplanes were designed specifically for that purpose. Cover photo shows a new Piper PA-18-A agricultural plane spraying farmland.

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides

Member Audit ABC *Bureau of Circulations*

Published Monthly by
WARE BROS. COMPANY
317 NORTH BROAD STREET, PHILADELPHIA 7, PA
Telephone MArket 7–3405

Staff

SAM LEWIS VEITCH........Publisher
A. A. WARE........Editor
HAMILTON C. CARSON........Associate Editor
G. P. TEEL, JR........Assistant Editor
K. F. WARE........Advertising Manager

Advertising Representatives

Harold H. Short, Jr.
51 E. 42nd St., New York 17, N. Y...MUrray Hill 7-6669
Al Zilenziger
333 N. Michigan Ave., Chicago 1, Ill....FRanklin 2–7100
Simpson-Reilly Ltd
1709 W. 8th St., Los Angeles 17, Calif....Dunkirk 8–1170
Simpson-Reilly Ltd.
703 Market St., San Francisco 3, Calif....Douglas 2–4994

Subscription Rates

U. S., its possessions, Cuba and Panama per year	$3.00
Canada and Mexico	4.00
Other Foreign Countries	5.00
Single Copy	.25
Back Numbers	.50

farm chemicals facts

. . . Briefly Noted

Mente & Co., Inc., New Orleans bag manufacturers, will sponsor a cocktail party at the sixth joint annual convention of the Georgia Cottonseed Crushers Association and the Alabama-Florida Cottonseed Products association in Savannah, Ga., June 2–3. The party will precede the annual banquet on the **opening day** of the convention.

Chase Bag company displayed its entire line of containers and packaging materials at the American Management Association's recent packaging exposition. Great interest was shown for the company's **Sharkraft** and **Polytex** materials.

James T. Turner has joined Pacific Coast Borax company, Southern division, as assistant agronomist.

Plant nutrients in chemical fertilizers produce as good crops as those in manure or composted organic matter, according to **Jackson Hester,** of Campbell Soup company. Hester, agricultural research specialist, reported his findings on experiments with tomato yields.

Died: Gabriel H. Schoen, president of Schoen Brothers, Inc., and POM Chemical Industries, Inc., after a short illness.

Bemis has appointed **R. D. McAusland** director of Western operations and **F. V. Deaderick** director of Eastern operations. Both have been with the bag company for many years.

Recent Chilean nitrate strike has been settled and loadings of the substance resumed early in May, Chilean Nitrate Sales corporation announced in New York.

William R. Thurston, president of Thurston Chemical company, has been elected a director to represent the seventh district on the U. S. Chamber of Commerce. He was nominated by the Joplin, Mo., C. C.

First chemical fertilizer plant to be set up in Dominican Republic started operation last month. The $250,000 plant is owned by Antillana Commercial company. It has a daily capacity of 225 tons.

National Soil Conservation, Inc., is marketing a greensand-marl land dressing called **Marland.** The product acts as a porous base exchange material in the soil and is designed for lawns, flower beds, baseball diamonds and golf fairways. The manufacturer claims Marland can retain potash and ammonia salts through application of water soluble fertilizer salts which enter the soil.

Died: Robert R. Kurtz, of the credit management and purchasing departments of John Powell & Co., Inc. Kurtz, an airforce veteran of World War II, joined Powell in 1945.

Dr. C. S. Harris is new entomologist for insecticide division of Prentiss Drug and Chemical. He formerly was entomologist and agricultural specialist with Shell Oil.

Order pesticides and fertilizers early is the advice of Secretary of Agriculture Brannan. **Brannan** urged early ordering to facilitate moving to farms the heavy volume of farm chemicals needed to support this year's big farm output.

Hubert A. DesMarais is new general sales manager of **Pennsalt** of Washington. Formerly with General Dyestuffs corporation, he will have offices in Tacoma.

Multi-million dollar ammonia-urea plant will be built by **W. R. Grace & Company** soon in the Middlewest. The plant will have a daily capacity of **250 tons** and will synthesize ammonia from natural gas, converting part of it to urea. Products will be sold for agricultural and industrial use.

Export restrictions on **BHC** and **sulfur** formulations have been removed by the Office of International Trade. This applies to BHC formulations containing less than one per cent gamma isomer of BHC and formulations with less than 20 per cent sulfur.

New farm chemicals will be tested on a wide variety of crops under plans of an expanded grant-in-aid program announced by **Columbia-Southern Chemical** corporation. More than 30 universities will receive the grants this year.

Mathieson Chemical's Curtis Bay plant won a Merit Award from Baltimore Safety Council recently for working more than one million man-hours without a lost-time accident.

"The Grasslands Miracle," NFA's new sound and color movie, was premiered in Washington, D. C. May 15, at a social hour in honor of **W. R. Allstetter,** the association's new vice president. A 12-minute picture designed to stimulate interest in the pasture movement, the film was sponsored by the Joint Committee on Grassland Farming. Copies are available for **loan and sale basis,** NFA reports.

Limited exposure to newer insecticides shouldn't cause illness, according to **Dr. William F. Durham,** a government biochemist. In a recent speech at the Industrial Health Conference in Cincinnati, he said there is no scientific evidence to support claims of a few clinicians that a wide variety of illnesses are caused by insignificant exposure to pesticides.

Legislation troubles aren't limited to the United States. News from Britain is that legislation tightening restrictions on use of chemicals in agriculture is expected but probably won't become effective during this spraying season.

William B. Copeland, vice president of **Smith-Douglass** company, has returned to the home offices of the organization at Norfolk, Va., after being in charge of Midwest operations at Streator, Ill.

Smog may be the cause of injury to crops on the West Coast. The University of California experiment station is studying the problem to determine crop injury from industrial pollutants in smog.

A new fertilizer plant on a 15-acre site is planned by Cooperative Fertilizer Service, Richmond, Va. Plant will be 120 by 368 feet, with annual capacity of 40,000 tons. Fertilizer will be manufactured from nitrogen solutions, sulfate of ammonia, superphosphate, muriate and sulfate of potash.

Another Revolution

The farm chemicals industry is leading South America in revolutions these days.

Revolutions, in fact, are getting to be "old hat" in the industry.

We're not, of course, talking about the bloody type of revolution in which governments are deposed and whole economies changed.

Not that economies aren't changed by the revolutions we mean, it's just that they occur quietly and with no bloodshed—just a lot of trial, error and hard work.

Revolutions to which we refer are the development of new chemicals and new methods which have spurred the advance of agriculture and aided in record crop yields.

In recent years this magazine has reported development of an amazing series of farm chemicals.

There have been DDT, Toxaphene, Aldrin, Parathion, as well as many new types of more efficient plant foods. This year two major "revolutions" stand out.

First there was Krilium.

The Monsanto product, a synthetic soil conditioner 100 to 1,000 times more effective than compost in improving soil structure, was described in the January FARM CHEMICALS.

Now it's Systox.

This product, developed by Pittsburgh Agricultural Chemical company, a division of Pittsburgh Coke and Chemical company, had its debut at an industry and press conference in New York May 6.

Systox, claimed to be the first true systemic insecticide ever approved in the United States, is described in detail in this issue. Like those wonder ball-point pens, Systox works under water—that is, the chemical can't be washed off because it enters the plant system.

The surprise and interest which greeted the announcement that Systox had been developed was caused not by the fact that it is a systemic, but because *it has received federal approval for limited use this year.*

Entomologists have known about systemics for years. Much research has been carried on in the field. But news that systemics had reached the stage of practical application came as a bit of a shock.

As recently as March 12, an item in the USDA Employee News Bulletin, in discussing the chemicals, which are translocated throughout plant systems, said ". . . research studies now going on are highly preliminary and experimental."

Apparently unaware that Pittsburgh Agricultural Chemical company would offer a systemic chemical two months later, the article continued:

"Firm facts must be established about their advantages and disadvantages so that indiscriminate applications will not occur, if and when the formulations are made available from commercial sources."

THE new systemic has a big future. A statement from the Pittsburgh company cautions that at the moment the insecticide is approved only for control of aphid and two-spotted mite on cotton, but goes on to say ". . . field tests conducted in virtually every state in the union indicate it is effective against a wide range of insect pests and can be used on many other crops when application directions are followed carefully.

"These tests have demonstrated clearly the effectiveness of Systox on typical insects, grains, forage crops and tobacco."

In another statement, Dr. J. B. Skaptason, vice president in charge of sales, gives an indication of the effect systemics will have on farm chemicals expansion in the next few years:

"Further research already in progress indicates that other related materials which we are developing possess the systemic action of Systox.

"These chemicals also undoubtedly will find a place commercially during the next few years.

"Thus the field of systemics is ever-expanding, in that the limitations of any one compound are being overcome by the use of similar type or related chemicals which may have particular advantages for particular plants or growing conditions."

Use of systemics raises several problems. First there is the case of residues. Heretofore, residue data were concerned with the surface of plants. Now attention will have to be turned toward study of internal residues. On this subject Pittsburgh says it has found that Systox is rapidly detoxified within the plant and that tests show residues resulting from foliar application "disappear quite rapidly."

Secondly, precautions must be taken when systemics are applied because of their high toxicity.

One important facet of the systemic field hasn't yet been fully explored but gives promise of bringing still another "revolution" to agriculture. This is the application of systemics to roots in irrigation water.

Such a method would save Farmer Jones a lot of work by reducing his application time immeasurably, help make plants safer from pests and ease the harassed industry leaders who have been wracking their brains for a method of filling that much talked about "fifth plate."

With continued research and development of the kind that has produced Systox and other recent chemicals, the plate will be filled!

—HAMILTON C. CARSON

serving over 100 principal industries through *AA Quality* factories and sales offices

Air view of A.A.C. plant at Detroit, Mich. . . . 30 A.A.C. factories and sales offices, most of them in or near principal industrial centers, assure dependable service.

AA Quality

for over 85 years
a symbol of quality
and reliability

principal *AA Quality* products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Commercial Fertilizers
Superphosphate — Sulphuric Acid
Insecticides and Fungicides
Phosphoric Acid and Phosphate
Phosphorus and Compounds of Phosphorus
Fluosilicates — Salt Cake
Gelatin — Bone Products
Ammonium Carbonate

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

farm chemicals outlook

Report from Washington
by Fred Bailey & Don Lerch

Sulfur is on the "loose". In sharp contrast to government predictions of a few months ago, supplies are definitely easing. Carloads of acid have been hunting buyers in some parts of the country.

"Practically meeting demand" is the way NPA sums up the situation. There are few major hardship cases which are not being taken care of with some relief, according to officials. While this is small comfort to the manufacturer who still is short or who has tailored plant schedules to meet an expected smaller supply, it does indicate a drastic change from conditions at the beginning of the year.

Superphosphate production during the first quarter of this year averaged well above the 1950 rate according to the latest estimates. Total output during this fertilizer year may be considerably higher than early government estimates. While USDA and NPA predictions differ somewhat, Washington would not be surprised to see production come close to 1951 output.

Long-range sulfur picture still is unsettled, however. Interpretation of conditions during the next few years is held by many to be the key to the extent of expansion into nitraphosphate production. It's a problem for the "board of directors".

Here are some of the factors:

1. DPA anticipates a net increase in sulfur production of 1,080,000 tons by 1955.
2. Because this seems to assure a gradual increase in the supply of sulfuric acid, USDA is figuring that construction of 400,000 tons of non-sulfur using phosphate capacity will be sufficient to bring production and supply in balance by then.
3. USDA estimates 1955 superphosphate requirements at 3,485,000 tons. The present rate of production is about 1,250,000 tons short of the 1955 goal.

Since industry reports enough capacity at present to produce enough superphosphate to meet even the 1955 goal, the big problem is how far to go with nitraphosphate plants. The government is not sure . . . industry is uncertain.

Some nitraphosphate plants will be built, however. Plans on at least four plants are reported well along.

Sales forces again are under pressure as farmers feel the pinch of falling prices and increasing costs. Insecticide salesmen are experiencing the same lag which hit the fertilizer industry earlier this year. Sales in both fields are running behind schedule with big drives under way to make up the volume.

Lateness of the season is blamed for part of the delayed buying. However, most observers credit the farmers' economic position with causing most of the delay.

Farm debt is showing a fast rise. During the past year long-term farm debt increased 9.5 per cent. Short-term debt jumped by 20 per cent. Production Credit Association loans increased 22.8 per cent during this same twelve-month period. The dramatic impact of nation-wide strikes is keeping the farm problem in the background.

There is little chance of raising farm price supports before the election. Farm legislation and politics are engaged in such pace-setting antics that about all you can see is a big blur. The two are so intermingled that it would be like picking salt from sand to separate them.

Senate Agriculture Committee hearing to raise supports to 100 per cent of parity is meeting with little real enthusiasm. Impetus for higher supports is almost entirely from a minority group in Congress. Senator Anderson (D.-N. M.) helped write the present law and will oppose changes. House Agriculture Committee Chairman Cooley (D.-N. C.) has plans to make no move to get higher supports enacted into law.

The National Grange and the Farm Bureau oppose tampering with supports at this time. The Grange is preparing new legislation but will not introduce it at this session of Congress.

Companies selling the farmer face a tougher fight for his business. Some of the reported concessions made this Spring may be only the beginning.

Watch for the decision of agricultural colleges and the Extension Service on participating in the USDA's Department-wide fertilizer sales plan. Move is instigated by PMA. It has the "front office" endorsement.

Real test will be whether the plan can be coordinated in the states. Most agronomists agree that fertilizer recommendations must be localized to be really helpful to the farmer. The college and the county agent are habitual sources for recommendations on fertilizer applications.

Broadside promotion by Washington may be helpful in stimulating interest in heavier fertilizer applications. However, the attitude of the states is considered here to be of top importance.

New booklet by the Department shows how increased fertilizer applications boost yields of key crops in various regions of the country. It is the kick-off for the big promotion program.

The pesticide industry is fighting government moves to build DDT plants abroad. Industry spokesmen see the plan as an "opening wedge".

India and the Middle East are the tentative sites for construction of these plants. Initial meetings showed that government officials had no plans for obtaining raw materials or for formulating the basic chemicals.

Export business is considered of growing importance to U. S. manufacturers. Most companies are not expected to look with favor on government competition.

Anthrax outbreaks have stirred little industry-wide action so far. There is considerable difference of opinion as to the likelihood of fertilizer being a prime source of spreading the infection. Apparently, anthrax spores will not grow in contaminated bone meal. However, the dread disease spores are indigenous to the soil and live there for years.

Contaminated feed is singled out as the main source of the present outbreak. Stories that Belgium bones were the sole carrying agent are not correct. The infection has been traced to a shipment of bones from Antwerp . . . but the bones were a mixture of imports from many parts of the world.

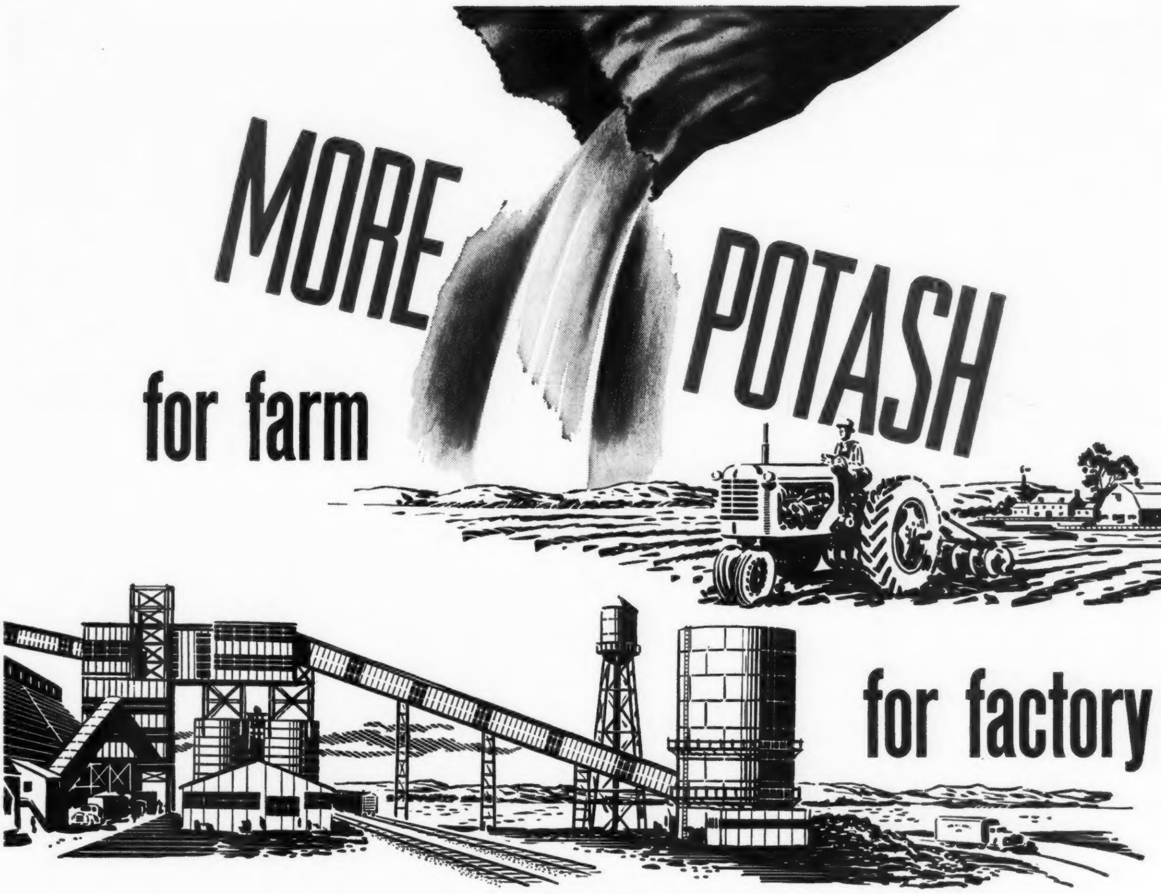
USDA is tossing the solution of the problem to the states. Stricter inspection laws for plants using bones for both feed and fertilizer may result in some instances.

Great fear is that farmers will not report all cases. Unless dead animals are properly handled by feed and fertilizer plants, officials see a further spread.

Mississippi's new "poison law" is causing consternation among some members of the industry. Act requires all non-resident companies to designate the Mississippi Secretary of State as "agent" and contains authority to require the posting of a $10,000 fidelity bond. Industry leaders opposed this bill and will seek to prevent its adoption by other states.

Behind USDA's food production drive . . . one out of every three Europeans lives on imported food. This fact together with our own growing population is putting the pressure on increasing food production now.

Cold war with Russia over Europe goes on. Administration insists we need larger food stockpiles to "trade on". French agriculture is lagging. Russia may try to capitalize further on our short stocks of food . . . watch it.


MORE POTASH
for farm
for factory

Systox gets green light

for cotton use this year

SYSTEMIC PESTICIDE GAINS APPROVAL

Farm Chemicals

Staff Report

THE fascinating story of systemic pesticides reached its climax May 6.

The big news came at a press demonstration in the Waldorf-Astoria hotel in New York City. Richard M. Marshall, president of Pittsburgh Coke & Chemical company, announced marketing of a revolutionary new type chemical, said to be the first true systemic insecticide ever approved for use in the United States.

The revolution, just one of many in the farm chemicals industry which have been startling the public recently, was a long time coming.

For years research workers in agricultural chemistry had been working toward development of a true systemic insecticide or fungicide.

Advantages of using a systemic insecticide long had been dreamt of by research workers exhausting the field.

After a farmer applied a systemic, he would have the following advantages over conventional insecticides:

1. It would render treated plants toxic to insects three to four times longer.
2. Rain could not wash off or dilute the chemical because it would be absorbed into the plant.
3. It would be effective in small doses.
4. It could be applied to seeds before planting, giving protection to the young plants for a considerable time.
5. It would not have to be sprayed on insects to be effective.

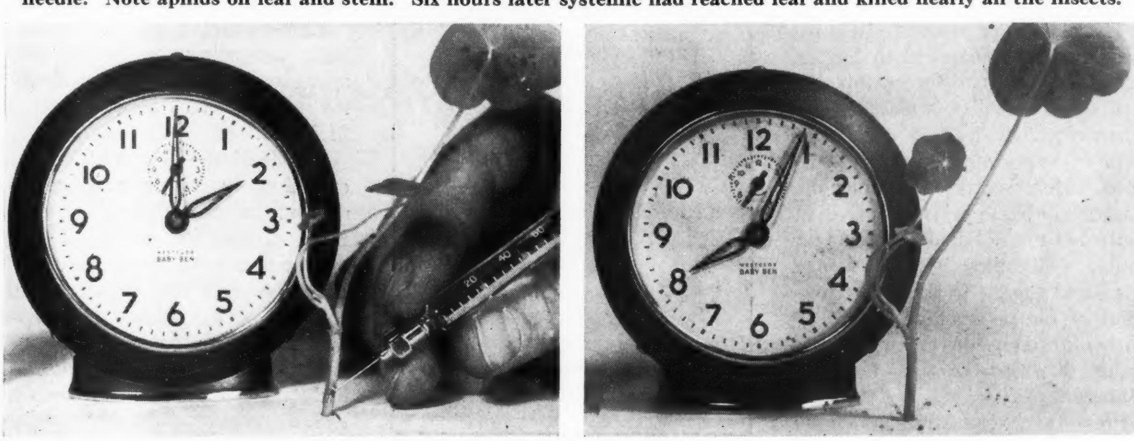
It was only natural, with all these advantages, that 150 leaders in the farm chemicals industry and the press gathered in New York to hear an announcement that such a pesticide, with all the advantages cited, had been developed and had received approval for limited use this year.

Federal Approval

Called "Systox," the product recently was given federal approval for control of aphid and two-spotted spider mite on cotton. It will be used only as a spray for the present.

Much has been written about tentative experiments in developing systemics. W. J. Haude, head of the Pittsburgh Agricultural Chemical company, the agricultural division of Pittsburgh Coke & Chem-

At 2 p.m. nasturtium plant heavily infested with aphids was injected with Systox at base of stem with hypodermic needle. Note aphids on leaf and stem. Six hours later systemic had reached leaf and killed nearly all the insects.



Just how effective Systox is in controlling insects is shown in this photo. Row on left had one application, plants at right were untreated. As untreated plants were destroyed, insects went to healthy plants and were killed.

ical, described the exact nature in which Systox works.

Systox, as a true systemic, spreads throughout a treated plant by a physiological action known as translocation, he stated.

Technically, it is an organic phosphate ester, of the empirical formula $C_8H_{19}O_3S_2P$.

The chemical is marketed as a concentrated liquid which is added in minute proportions to water. It can be applied in either of two ways: to the soil around the roots or sprayed on the plant itself. In either case it is absorbed quickly and distributed through roots, stems or branches and foliage, making the entire plant toxic to sucking insects for a long time.

Intensive Research

Three years of intensive field research were climaxed when Systox was given approval for cotton, according to Haude. Field tests on other crops by leading entomologists in experiment and sub-stations widely scattered around the country indicate it is effective in control of many harmful insects on fruits, vegetables, grains, forage crops and sugar. Original development of the product was done by Farbenfabriken Bayer, Germany, under direction of Dr. Gerhard Schrader.

Press and industry personnel saw vividly just how effective Systox is. In demonstrations conducted by W. Scott James, technical sales director of the agricultural division, two groups of cotton plants were heavily infested by aphids and two-spotted spider mites.

One group of plants had been treated by injection with Systox with a hypodermic needle the night before. The other plants were untreated. Results showed the effectiveness of Systox. At the base of the treated plants lay scores of dead insects, victims of the rapid killing effect of the systemic.

James said Systox kills in two ways:

1. As a stomach poison when it is sucked into the digestive system by the insect and
2. As a contact poison when it reaches the nervous system of the insect.

Here are some other vital facts about Systox, as revealed at the press conference:

Compatibility

Compatibility—Systox is safe with many pesticides, including DDT, Dieldrin, BHC, Chlordane, Toxaphene, Quinones, Aldrin, rotenone, pyrethrum and various oils; doubtful with zinc arsenate, calcium arsenate, Paris green, cryolite and organic mercury compounds; incompatible with Bordeaux, lime and lime sulfur.

Toxicity—residues reduce to a minimum quickly. These residues are considerably lower than DDT's level of 4 to 5 ppm, 12 to 15 days after application and arsenate of lead's 5 to 7 ppm after 15 to 20 days, according to the manufacturer.

Length of Effectiveness—kills insects for longer period than regular insecticides. Exact period uncertain but field tests have shown that only two applications a season are required for control in most cases.

Cost—exact price not available but, according to a company spokesman, cost of one application for cotton per acre would be \$1.50–\$2.

Application—Systox forms an emulsion in water and can be diluted to any desired strength. It is suitable for use in all power operated ground sprayers and aircraft sprayers. But, because of the toxicity of the material (it's approximately as toxic to mammals as Parathion) protective clothing, including nat al rubber gloves, a recommended for the operator. ◆

Technical Data On Systox

Following are the formula and specifications of Pittsburgh Agricultural Chemical's Systox, new systemic pesticide:

Empirical formula: $C_8H_{19}O_3S_2P$.

Molecular weight: 258.

Physical properties: light brown to pale yellow oily liquid with a typical odor.

Boiling point: 134° C. (2 mm.)

Vapor pressure at 33° C: 0.001 mm.

Specific gravity: $\frac{(20)}{4}$ 1.1183

Refractive index: $n\frac{20}{d}$ 1.4875

Solubility: Systox is soluble in most organic solvents and soluble in water to approximately 0.01 per cent.

Sen. Karl E. Mundt

Allan B. Kline

Milton S. Eisenhower

Attendance record seen . . .

June 16 - 18

NFA To Convene At Greenbrier

THE National Fertilizer Association has had some very important annual conventions during its 27 years of existence. But when representatives from plants all over the country meet at the Greenbrier in White Sulphur Springs, W. Va., June 16–18, the convention probably will be the most significant to date.

The problem of materials and equipment shortages will face the delegates, of course, but far more important will be the huge task ahead of getting more from less—making dwindling acreage produce one-fourth again as much food and fiber as it now is yielding so that our increased population will be fed according to our present high standard of living.

Helping NFA members air their problems will be distinguished agricultural, industrial and governmental leaders.

A look at the impressive list of speakers scheduled for the three-day convention at the famous West Virginia resort shows the importance the association attaches to the spring convention.

Distinguished Speakers

Set to address convention sessions are the following:

1. Milton S. Eisenhower, president of Pennsylvania State College;

2. U. S. Senator Karl E. Mundt (R.—S. D.);

3. John H. Stambaugh, assistant to the secretary of agriculture; and

4. Allan B. Kline, president of the American Farm Bureau Federation.

In addition, Russell Coleman, president of NFA and J. E. Totman, chairman of the association's board of directors, will address the convention, which probably will set an attendance record, according to advance registration figures.

Formal opening for the get-together is set for Monday, June 16, when registration will start at 9 a.m. At the same hour the board of directors will meet.

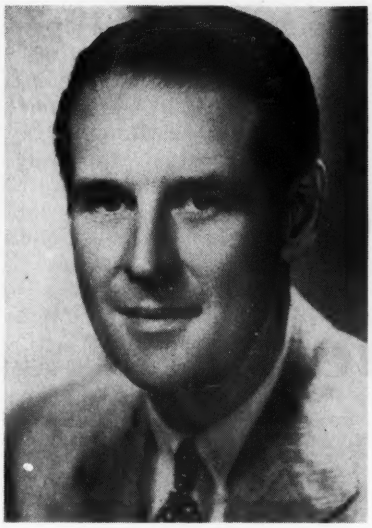
The Plant Food Research Committee will hold an open meeting at 10 a.m. to which all persons attending the convention will be invited.

To Discuss Problems

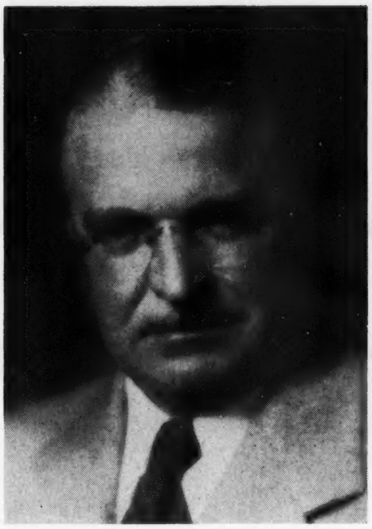
Feature of the meeting will be a presentation by the recently created subcommittee on Chemical Processing and Manufacturing.

George V. Taylor, of Spencer Chemical company, chairman of the committee, will lead the following committee members in a discussion of problems currently facing the fertilizer industry:

Edwin C. Kapusta, NFA, secretary; Richard E. Bennett, Farm Fertilizers; F. W. Darner, U. S. Phosphoric Products Division, Ten-



John H. Stambaugh



J. E. Totman

Russell Coleman

nessee Corporation; Leroy Donald, Lion Oil company; R. M. Jones, Barrett Division, Allied Chemical and Dye corporation; G. F. MacLeod, Sunland Industries and H. B. Siems, Swift and Company.

Garden Party

A very successful social event inaugurated at last year's convention—a garden party for wives of convention delegates—will be resumed this year, according to the convention program. The party will be held at 4 p.m. in the Old White Patio of the Greenbrier.

Mundt's address, entitled "Where To In '52?" will lead off the first general meeting at 10 a.m. Tuesday.

Stambaugh will follow with a talk on "Agriculture—An American Business Opportunity." The annual convention address will be given by Chairman Totman to conclude the morning session.

A ladies' bridge party will highlight afternoon activity, with golf, tennis and other athletic events scheduled for the men.

"Festival Night" at the convention has been planned for Tuesday evening. International Mineral and Chemical corporation will offer a refreshment hour to lead off the party at 6 p.m.

Convention Dinner

A convention dinner will follow at 7 and at 9 the nationally famed Skyliners quartette will present a half-hour of songs and musical novelties.

Dancing in the ballroom to the music of a Meyer Davis orchestra will close the gala evening.

Eisenhower will deliver his speech as a keynote of the second general meeting on Wednesday. His subject will be "Framework for Peace." Kline's talk, on "Our Agriculture and America's Defense," will follow, and President Coleman's annual address will wind up the speechmaking.

Convention committee heads include Mrs. J. E. Totman, ladies' hospitality; Mrs. E. M. Kolb, ladies' golf; Mrs. J. A. Naftel, ladies' bridge; R. S. Rydell, golf; A. A. Schultz, horseshoe pitching contest, George Burns, tennis and Gene Van Deren, men's hospitality. ◆

Main front entrance showing circled driveway and new porte-cochere of the Greenbrier, White Sulphur Springs, W. Va., where NFA will meet.

Plant Food Council To Meet at Homestead

THE importance of fertilizer to the national welfare will be the central theme of the important Seventh Annual Convention of the American Plant Food Council at the Homestead, Hot Springs, Va., June 19–22.

Meeting at a time when the fertilizer industry is faced with the tremendous task of helping agriculture produce record-breaking crop yields to meet an ever-expanding economy, members of the council will hear key speakers discuss the problem.

Leaders in agriculture, education, research and government will talk on various facets of the fertilizer industry, with emphasis on major factors influencing the future of farming and the relationship of fertilizers to the food economy, according to Paul T. Truitt, president of the council, who outlined the program for the convention.

Said Truitt, "The Department of Agriculture appropriately has emphasized that the world-shaking events of the past year have speeded American agriculture over the threshold of a new era, an era which they emphasize 'might be called the fertilizer era.'

'New Phase'

"We heartily concur with the agricultural leadership in the observation that the present national emergency has pushed agriculture into a new phase of development in which the fertilizer industry will play its greatest role in history.

"With this thought in mind," he continued, "we believe the distinguished speakers at our 1952 convention will discuss in a down-to-earth fashion the far-reaching contribution the fertilizer industry will make to the nation's farmers."

Byrd to Speak

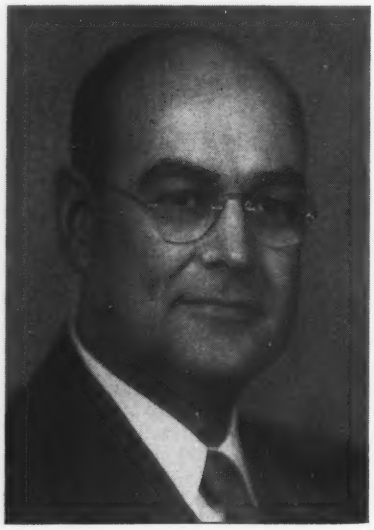
Principal speaker at the convention will be U. S. Senator Harry F. Byrd (D.–Va.), who will address the banquet session of the meeting at 9 p. m., June 21.

More than 500 industry members are expected to be on hand for the three-day convention activities.

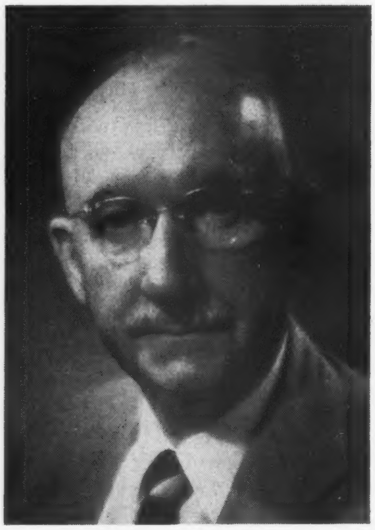
Outstanding soil scientists, economists, farm organization, congressional and U. S. Department of

Rep. Harold D. Cooley

William A. Minor Jr.



Prof. C. J. Chapman



Agriculture leaders will speak at the morning sessions on June 20 and 21.

Opening address at the convention will be given by President Truitt June 20 at 9:45 a. m.

Other speakers scheduled for the opening day include Prof. C. J. Chapman and Dr. H. F. DeGraff. Prof. Chapman, extension specialist in soils, University of Wisconsin, will talk on "Pasture Improvement by Direct Fertilization," at 10:30 a. m.

Dr. DeGraff, H. E. Babcock Professor of Economics, Cornell University, will discuss "Fertilizer's Relationship to the Food Economy," at 11 a. m.

Business Session

The annual business session, at which eight new members will be elected to the board of directors, will conclude Friday's activities. The business session will be preceded by a memorial service for council members who have died since the 1951 convention.

The chairman of the House committee on agriculture, Rep. Harold D. Cooley (D.–N. C.), will lead off the speechmaking Saturday morning. His talk has been set for 9:45 a. m.

Highlight of the morning will be a panel discussion on "Major Factors Influencing the Future of Agriculture." Dr. Paul D. Sanders, editor of "The Southern Planter," Richmond, Va., a nationally prominent agricultural authority, will moderate.

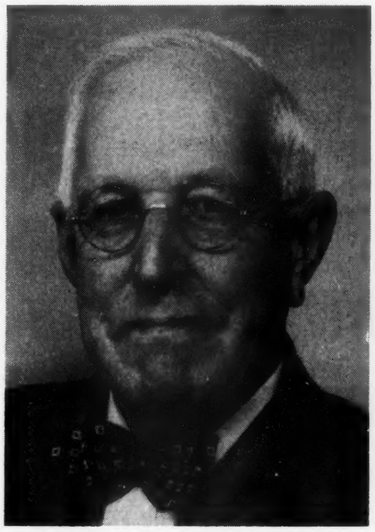
Sen. Harry F. Byrd

Scheduled to offer their ideas concerning the topic will be panel members Dr. Byron T. Shaw, administrator, Agricultural Research Administration, U. S. Department of Agriculture; O. V. Wells, chief of the Bureau of Agricultural Economics, USDA; D. Howard Doane, founder of Doane Agricultural Service, St. Louis and Herschel D. Newsom, master of the National Grange, Washington, D. C.

"We Too Have a Job To Do" will be the topic of the concluding address Saturday morning. Discussing the subject will be W. A. Minor, assistant to the secretary, USDA, and chairman of USDA's Fertilizer Policy committee.

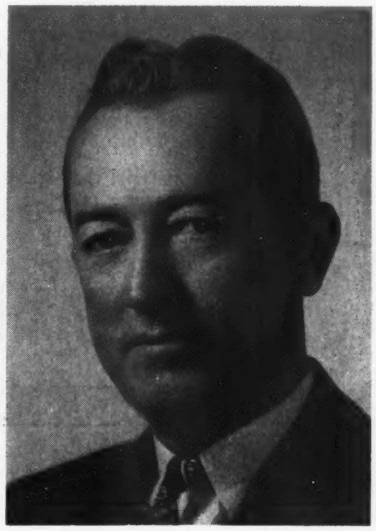
Entertainment at the convention will include golf and tennis tournaments. ◆

D. Howard Doane



Dr. Byron T. Shaw

Dr. Paul D. Sanders



CLARENCE CHASE

Fertilizing pastures with 10-10-10 produced an extra $90 worth of dairy feed per acre for Gale and Clarence Chase,

SUN PRAIRIE, WIS.

THE CHASE BROTHERS of Sun Prairie, Wisconsin were among farmers who cooperated in the pasture improvement program sponsored by the University of Wisconsin under the Direction of C. J. Chapman, Professor of Soils. Here's their report:

"We fertilized part of our pasture last spring with 10-10-10 at about 500 pounds per acre. The growth of grass was so rank we could have cut a hay crop by the middle of June.

"In a demonstration set up on our pasture by the county agricultural agent, yields were taken. The unfertilized area made 2531 pounds of dry material per acre, and the fertilized made 5737 pounds per acre, an increase of 2905 pounds. This extra feed was the equivalent of 16-18% dairy feed which, at $60 a ton, would be worth about $90."

GALE CHASE

Bigger yields for farmers mean better business for you

• High-nitrogen mixed fertilizers have proved again and again that they pay their own way and give the user a nice profit to spare. As farmers learn more about their benefits, demand goes up and up.

To give your customers the most effective high-nitrogen fertilizers, use U·S·S Ammonium Sulphate for a major part of the nitrogen content. It's a dry, free-running material that stands up well in storage and performs well in distributing equipment. Its all-ammonia nitrogen won't leach, yet becomes readily available during the growing season.

Promotion efforts you put behind high-nitrogen fertilizers containing U·S·S Ammonium Sulphate will yield big returns. You and your dealers can recommend it for pastures, corn, wheat and other small grain. The spring fertilizer season is at its height; get your share of this business. United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

U·S·S AMMONIUM SULPHATE

UNITED STATES STEEL

Data on acid-insoluble ash and carbonate contents are given in second report of

Mixed Fertilizers

By K. G. Clark, V. L. Gaddy, Alberta E. Blair and F. O. Lundstrom*

DATA on the different forms of phosphorus in mixed fertilizers and superphosphates marketed in the United States during the 1949–50 fertilizer season have been reported[3]. Information with respect to the acid-insoluble ash and carbonate contents and to the acid- or nonacid-forming quality was obtained in the same survey and is given in the present paper.

For purposes of the survey, fertilizer control officials of 25 states supplied 425 1949–50 official inspection samples of mixtures and 92 of superphosphates. The mixtures represented the products of 157 manufacturers and were marketed in 91 grades and 58 plant-nutrient ratios. Of the 425 samples, 23 represented N-P, five N-K, 24 P-K and 373 N-P-K mixtures. More than half of these samples represented products marketed by 15 of the manufacturers.

Eleven N-P-K grades were represented by at least 10 samples each for a total of 244 or 57.4 per cent of the 425 samples. Each of 17 plant-nutrient ratios was represented by multiple grades for a total of 273, or 64.2 per cent of the samples.

Analytical Methods

In determining the acid-insoluble ash content of the mixtures and superphosphates a weighed sample was digested successively in water and in HCl (1 + 4) at the boiling point in both cases. The insoluble residue was ignited at 800° C. for one hour, digested in boiling HCl (1 + 4), recovered, dried at 125° C. and weighed.

The calcium carbonate equivalent of the carbonate-carbon content was determined by the procedure of Clark, Rader and Walls[4] in which the CO_2 evolved on treatment of the sample with HCl is absorbed in Ascarite and weighed.

The acid- or nonacid-forming quality of the samples was determined in accordance with the official method of the Association of Official Agricultural Chemists[1] using the glass-electrode procedure in determining the acid-base balance of the ash.

In most instances the fertilizer officials supplied the needed nitrogen analysis but in a few cases it was necessary to determine the nitrogen content. The citrate-insoluble P_2O_5 was determined in connection with the phase of the survey concerned with the different forms of phosphorus[3].

A summary of the analytical data with respect to the several classifications of superphosphates and mixtures is given in Table 1. This table also indicates for each region the average grade of the samples and the numbers of samples, manufacturers, and states.

Wide variations were observed in each region between the maximum and minimum values for acid-insoluble ash, $CaCO_3$ equivalent of carbonate carbon, and net acid-base balance for the various classifications of superphosphates and mixtures.

Discussion of Results

On the average the mixed fertilizers contained more acid-insoluble ash and $CaCO_3$ equivalent and were more acid-forming than the superphosphates. A ton of the average fertilizer formulated with normal superphosphate as the phosphorus source appears to contain about 150 pounds of acid-insoluble inert matter in excess of that naturally present in the superphosphate and 100 pounds of $CaCO_3$ equivalent.

Approximately one-eighth of the average mixed fertilizer, therefore, consists of materials not primarily useful as sources of the major plant-nutrient elements—nitrogen, phosphorus and potassium. As will appear later, more than one-half of the mixtures contained more than 15 per cent of inert inorganic ingredients, nearly one-fourth contained more than 20 per cent, and only about 15 per cent contained 10 per cent or less.

N-P mixtures contained relatively little acid-insoluble ash and

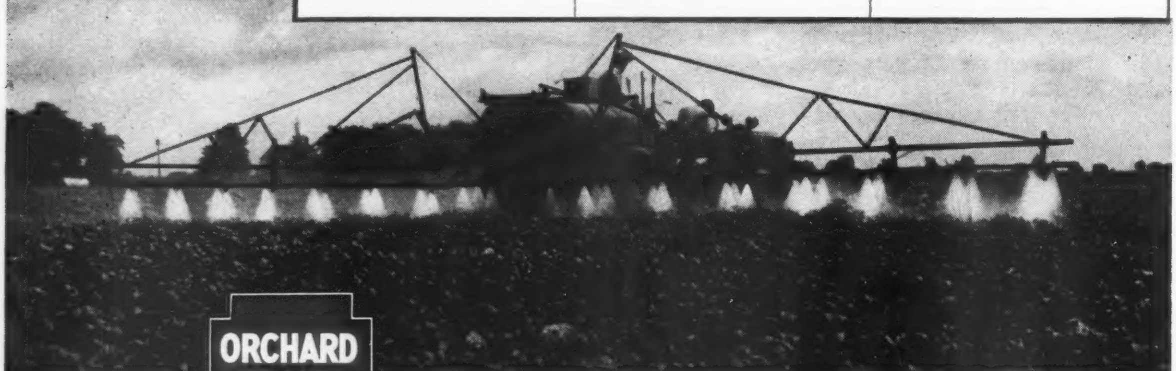
*Senior chemist, associate chemist, formerly junior chemist and assistant chemist, Division of Fertilizer and Agricultural Lime, respectively.
Contribution from the Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture, Beltsville, Md.

Formulators! Dust Mixers!
Use "GENERAL CHEMICAL"
BASE MATERIALS and TOXICANTS
and be sure of the best!

BASIC CHEMICALS FOR AGRICULTURE

Check Your Needs Here... Then Call General Chemical!

DDT Technical Dust Base, 50% & 75%	**LEAD ARSENATE** Standard Astringent Basic	**LINDANE** Technical Dust Base, 25% Emulsifiable Concentrate, 20%
BHC Technical (15%, 36% & 90% Gamma) Dust Base, 12% Gamma	**DDD** Dust Base (50% DDD)	**PARATHION** Dust Base
CALCIUM ARSENATE Standard Low Lime	**ZIRAM** Dust Base (76% Zinc Dimethyl Dithiocarbamate)	**FERBAM** Dust Base (76% Ferric Dimethyl Dithiocarbamate)
2,4-D Acid, Amine, Esters Formulations	**2,4,5-T** Acid, Amine, Esters Formulations	**TCA SODIUM SALT** 90% Dry Powder 50% Liquid Concentrate
POTASSIUM CYANATE Technical Cotton Defoliant	**DINITRO** Pre-Emergence Herbicides	**ALDRIN** 20% Dust Base



ORCHARD BRAND
SPRAYS & DUSTS

Agricultural Chemical Department

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Serving Agriculture from Coast to Coast

Table 1.—Summary of Acid-Insoluble Ash and $CaCO_3$ Equivalent Contents, and Acid- or Nonacid-Forming Quality of Superphosphates and Mixed Fertilizers, by Regions.

Region	Samples				Acid-Insol. Ash		$CaCO_3$ Equiv. of Carbonate Carbon		Acid- or Nonacid-Forming Quality[1]	
	No.	States	Mfrs.	Average Grade	Range	Mean	Range	Mean	Range	Mean
		No.	No.	Per cent			Pounds per ton			
New England										
Superphos., 19–20 per cent	12	3	9	0 –19.50– 0	45–176	95	0– 6	2	10 – 57	37
All mixtures	34	3	18	5.38– 9.76–10.44	33–487	112	2–475	111	270B–610	167
N-P mixtures	1	1	1	4 –10 – 0	—	294	—	132	—	31
P-K mixtures	3	3	3	0 –18 –18	33– 76	49	2– 23	10	48B–139B	91B
N-P-K mixtures	30	3	17	5.97– 8.93–10.03	24–487	117	3–475	120	270B–610	198
Mid. Atlantic										
Superphos., 19–20 per cent	17	4	13	0 –19.76– 0	57–155	92	0– 5	1	28 – 94	44
All mixtures	50	4	26	4.08–11.04– 7.54	20–519	182	0–360	71	293B–857	157
P-K mixtures	2	2	9	0 –14 – 7	222–287	254	0– 25	13	42B– 78B	60B
N-P-K mixtures	48	4	26	4.25–10.92– 7.56	20–519	179	2–360	73	293B–857	166
S. Atlantic										
Superphos., 18–20 per cent	15	4	11	0 –18.87– 0	63–273	117	0– 18	4	4B– 75	47
All mixtures	122	4	56	4.14– 8.39– 6.32	11–787	272	2–704	128	423B–786	55
N-P mixtures	1	1	1	4 –16 – 0	—	78	—	84	—	86
N-K mixtures	5	3	4	10.40– 0 –10.40	17–306	178	10–704	255	269B–786	190
P-K mixtures	1	1	1	0 –12 –12	—	71	—	315	—	423B
N-P-K mixtures	115	4	54	3.90– 8.64– 6.15	11–787	280	2–450	121	233B–507	53
E. S. Central										
Superphos., 18–20 per cent	11	3	11	0 –19.64– 0	46–219	87	0– 7	2	12 – 91	52
All mixtures	48	3	26	4.38– 9.73– 5.54	39–521	171	4–511	202	240B–603	61
P-K mixtures	2	1	2	0 –13.00– 9.50	89–178	134	60–147	103	193B–240B	216B
N-P-K mixtures	46	3	25	4.57– 9.59– 5.37	39–521	173	4–511	207	225B–603	73
W. S. Central										
Superphos., 20 per cent	8	2	7	0 –20.00– 0	43– 89	67	0– 4	1	39 –101	67
All mixtures	23	2	16	5.17–10.35– 4.96	31–586	234	0–494	70	159B–1069	301
N-P mixtures	2	1	2	8.00–11.00– 0	31–346	189	2– 37	20	349 –1069	709
P-K mixtures	1	1	1	0 –14 – 7	—	141	—	1	—	6B
N-P-K mixtures	20	2	15	5.15–10.10– 5.35	31–586	243	0–494	79	159B–704	276
E. N. Central										
Superphos., 20 per cent	12	3	9	0 –20.00– 0	48–109	75	0– 20	5	5B– 59	28
All mixtures	81	3	33	2.36–12.69– 9.00	19–669	168	0–1155	96	805B–708	52
P-K mixtures	12	3	9	0 –14.00–13.00	27–319	122	0–155	53	363B– 31	110B
N-P-K mixtures	69	3	33	2.77–12.43– 8.30	19–669	176	0–1155	103	805B–708	81
W. N. Central										
Superphos., 20 per cent	6	2	6	0 –20.00– 0	40– 82	62	0– 19	4	94B– 64	21
Superphos., 46–49 per cent	2	1	2	0 –47.50– 0	50– 63	56	0– 5	3	4 – 33	19
All mixtures	30	2	17	3.60–14.97– 8.60	31–466	162	1–534	67	668B–1036	137
P-K mixtures	3	2	3	0 –21.33–10.67	59–233	165	1–534	185	55B–668B	262B
N-P-K mixtures	27	2	16	4.00–14.26– 8.37	31–466	162	1–337	54	166B–1036	181
Mountain										
Superphos., 17–18 per cent	3	2	3	0 –17.67– 0	75–105	86	0– 4	2	42 –121	73
Superphos., 42 per cent	1	1	1	0 –42 – 0	—	98	—	10	—	42
All mixtures	20	2	11	9.30–14.35– 1.15	30–337	100	0–500	61	59 –1534	836
N-P mixtures	16	2	10	10.06–14.56– 0	30–154	79	0–500	57	191 –1534	906
N-P-K mixtures	4	2	4	6.50–13.50– 5.75	67–337	185	2–284	75	59 –1104	555
Pacific										
Superphos., 18–20 per cent	4	2	4	0 –18.50– 0	73–117	91	0– 3	1	19 – 49	40
Superphos., 46 per cent	1	1	1	0 –46 – 0	—	74	—	6	—	2B
All mixtures	17	2	14	8.59– 9.65– 5.76	17–761	183	0–309	58	96B–1820	739
N-P mixtures	3	1	3	14.67–11.33– 0	44–169	79	1–165	60	841 –1820	1244
N-P-K mixtures	14	2	12	7.29– 9.29– 7.00	17–761	203	0–309	57	96B–1623	631
United States										
Superphos., 17–20 per cent	88	25	53	0 –19.50– 0	40–273	89	0– 20	3	94B–121	44
Superphos., 42–49 per cent	4	3	4	0 –45.75– 0	50– 98	71	0– 10	5	2B– 42	19
All mixtures	425	25	157	4.38–10.72– 7.06	11–787	196	0–1155	109	805B–1820	159
N-P mixtures	23	6	16	9.96–13.70– 0	30–346	99	0–500	59	31 –1820	859
N-K mixtures	5	3	4	10.40– 0 –10.40	17–306	178	10–704	255	269B–786	190
P-K mixtures	24	13	19	0 –15.25–13.08	27–319	129	0–534	74	668B– 31	140B
N-P-K mixtures	373	25	145	4.23–10.39– 7.06	11–787	207	0–1155	112	805B–1623	135

[1]B, nonacid forming.

Table 2.—Summary of Acid-Insoluble Ash and $CaCO_3$ Equivalent Contents, and Acid- or Nonacid-forming Quality of Normal Superphosphates and Principal Grades of Mixed Fertilizers.

Grade	Samples			Acid-Insoluble Ash		$CaCO_3$ Equiv. of Carbonate Carbon		Acid- or Nonacid-forming Quality[1]	
	No.	States	Mfrs.	Range	Mean	Range	Mean	Range	Mean
						Pounds per ton			
				Superphosphates					
17 to 20	88	25	53	40–273	89	0–20	3	94B–121	44
				Mixtures					
2–12–6	51	5	26	19–502	133	0–1155	120	805B–211	10
3–9–6	22	4	18	42–599	305	8–273	140	225B–142	33B
3–12–6	27	6	17	45–325	196	3–360	93	293B–245	45
3–12–12	17	5	12	40–669	147	2–116	31	11–275	130
4–8–6	18	2	18	61–688	435	2–348	95	206B–333	98
4–10–6	25	3	16	79–454	227	49–304	155	200B–88	4
4–10–7	10	3	8	46–470	224	8–339	132	110B–265	55
4–12–4	17	6	13	65–300	183	2–342	78	168B–370	155
5–10–5	27	11	20	41–441	202	0–414	128	233B–546	160
5–10–10	18	9	14	42–313	147	2–256	63	4–420	255
6–8–4	12	2	9	39–135	80	261–511	395	174B–136	16B

[1]B, nonacid forming.

Table 3.—Distribution of Mixed Fertilizers in Relation to Content of Acid-Insoluble Ash, and Sum of Ash Content and $CaCO_3$ Equivalent of Carbonate Carbon.

Acid-insoluble ash, pounds per ton	Acid-insoluble ash plus $CaCO_3$ equivalent of carbonate carbon, pounds per ton											
	0–100	101–200	201–300	301–400	401–500	501–600	601–700	701–800	801–900	901–1000	1101–1200	Tot.
					Per cent of total samples							
0–100	14.6	8.2	4.9	5.6	2.1	1.4	—	0.2	—	—	0.5	37.6
101–200	—	7.1	4.0	6.6	1.2	.2	0.2	—	—	—	—	19.3
201–300	—	—	9.6	7.5	2.8	.9	—	—	—	—	—	20.9
301–400	—	—	—	7.5	2.8	1.2	.2	.2	—	—	—	12.0
401–500	—	—	—	—	2.4	1.9	.2	—	—	—	—	4.5
501–600	—	—	—	—	—	1.9	1.6	—	—	—	—	3.5
601–700	—	—	—	—	—	—	1.4	.2	—	—	—	1.6
701–800	—	—	—	—	—	—	—	.5	—	—	—	.5
Tot.	14.6	15.3	18.6	27.3	11.3	7.5	3.8	1.1	—	—	.5	100.0

$CaCO_3$ equivalent, and exhibited the highest average acid-forming quality, 859 pounds per ton. N-K mixtures contained somewhat less acid-insoluble ash, somewhat more $CaCO_3$ equivalent, and were slightly more acid-forming than the average of all mixtures.

P-K mixtures contained less than the average acid-insoluble ash and $CaCO_3$ equivalent, and were generally non-acid forming. The N-P-K mixtures exhibited the highest observed values for acid-insoluble ash, $CaCO_3$ equivalent, and non-acid-forming quality.

The data are summarized in relation to the principal grades and to normal superphosphates in Table 2. Wide variations in ash and carbonate contents, and in net acid-base balance were noted for all grades listed. In comparison with superphosphate the mixtures contained considerable quantities either of acid-insoluble ash, carbonate equivalent, or both.

Table 3 shows distribution of the samples with respect to acid-insoluble ash content, sum of ash content and $CaCO_3$ equivalent, and the interrelation of these quantities. Three-eighths of the samples (37.6 per cent, 160 samples) contained less than 100 pounds of acid-insoluble ash per ton, and only about three-eighths of these

Table 4.—Distribution of Mixed Fertilizers in Relation to Content of $CaCO_3$ Equivalent of Carbonate Carbon and Acid- or Nonacid-forming Quality.

$CaCO_3$ equiv. of carbonate carbon, lbs. per ton		Acid- or nonacid-forming quality, lbs. per ton[1]																Total	
		0–100	101–200	201–300	301–400	401–500	501–600	601–700	701–800	801–900	901–1000	1001–1100	1101–1200	1201–1300	1501–1600	1601–1700	1801–1900	Sub-tot.	Tot.
									Per cent of total samples										
0–100	A	14.1	14.6	10.6	3.8	2.4	0.9	1.2	1.6	1.2	0.2	1.2	0.9	0.5	0.2	0.2	0.2	53.9	60.5
	B	5.2	1.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.6	—
101–200	A	8.9	1.4	.7	.9	—	.7	.2	—	—	—	.2	—	—	—	—	—	13.2	21.4
	B	6.6	1.2	.5	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2	—
201–300	A	1.4	.9	.5	.2	—	—	—	—	—	—	—	—	—	—	—	—	3.1	8.9
	B	2.6	2.6	.5	.2	—	—	—	—	—	—	—	—	—	—	—	—	5.9	—
301–400	A	.7	.2	—	—	—	—	—	.2	—	—	—	—	.2	—	—	—	1.4	5.6
	B	1.9	.9	1.2	—	.2	—	—	—	—	—	—	—	—	—	—	—	4.2	—
401–500	A	.2	—	.2	—	—	.2	—	—	—	—	—	—	—	—	—	—	.7	2.4
	B	.9	.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.6	—
501–600	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.5
	B	.2	—	—	—	—	—	.2	—	—	—	—	—	—	—	—	—	.5	—
701–800	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	.2	—	—	—	—	—	—	—	—	—	—	—	—	—	.2	—
1001–1100	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	—	—	—	—	—	.2	—	—	—	—	—	—	—	—	.2	—
1101–1200	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	—	—	—	—	—	—	.2	—	—	—	—	—	—	—	.2	—
Sub-tot.	A	25.4	17.2	12.0	4.9	2.4	1.9	1.4	1.9	1.2	.2	1.4	.9	.7	.2	.2	.2	72.2	100.0
	B	17.4	6.8	2.4	.2	.2	—	.2	.2	.2	—	—	—	—	—	—	—	27.8	—
Tot.		42.8	24.0	14.4	5.2	2.6	1.9	1.6	2.1	1.4	.2	1.4	.9	.7	.2	.2	.2	100.0	—

[1]A, acid forming; B, nonacid forming.

(62 samples) exhibited a sum of ash and carbonate equivalent of less than 100 pounds.

Fifty per cent (80 samples) exhibited a sum of 100 to 400 pounds, 10 per cent (16 samples), a sum between 400 and 800 pounds, and 0.5 per cent (2 samples) more than 1100 pounds. More than one-half of the samples (52.2 per cent, 222 samples) contained 100 to 400 pounds of ash and of these 18.9 per cent (42 samples) contained 400 to 800 pounds of ash plus carbonate equivalent. Approximately 10 per cent of the samples, 43, contained 400 to 800 pounds of ash and of these at least 40 per cent, 17, also contained appreciable amounts of carbonate.

Distribution of Samples

Distribution of the samples with respect to $CaCO_3$ equivalent, net acid-base balance, and the interrelation of these quantities is given in Table 4. One hundred and eighteen or 27.8 per cent of the samples were non-acid forming compared with 168, 39.5 per cent, which contained more than 100 pounds of carbonate equivalent per ton and 77, 18.1 per cent, which contained in excess of 200 pounds. Of the 168 samples containing more than 100 pounds of carbonate per ton 78, 46.4 per cent, were acid forming and 90, 53.6 per cent, non-acid forming. Nearly 55 per cent or 232 samples were acid forming in the range 0–300 pounds per ton compared with 26.6 per cent, 113, that were non-acid forming in the same range. A little more than one per cent of the samples, 5, were non-acid forming in excess of 300 pounds and 17.6 per cent, 75, were acid-forming in this range.

Inasmuch as superphosphate is the principal phosphorus source used in formulating mixtures and also the principal ingredient normally carrying an appreciable acid-insoluble ash content, a comparison of the ash content of mixtures and of superphosphates in relation to their phosphorus content provides an approximate measure of the inert inorganic material that was added.

Such a comparison is presented in Table 5 for those phosphorus-containing mixtures collected in both single- and multiple-strength grades. Similar comparative data also are given for $CaCO_3$ equivalent of carbonate carbon and net acid-base balance. Although these quantities are more closely related to nitrogen content than to the phosphorus in the mixtures, the values for grades having the same plant-nutrient ratio are in approximately the same proportion in either case.

Table 5.—Comparison of Acid-Insoluble Ash and $CaCO_3$ Equivalent of Carbonate-Carbon Contents, and Acid- or Nonacid-forming Quality of Single- and Multiple-Strength Grades of Superphosphates and Mixed Fertilizers.

	Samples			Acid-insol. ash		$CaCO_3$ Equiv. of Carbonate Carbon		Acid- or Nonacid-forming Quality[1]	
Grade	No.	States	Mfrs.	Range	Mean	Range	Mean	Range	Mean
				Pounds per unit of total P_2O_5					
				Superphosphates					
17 to 20	88	25	53	1.9–13.2	4.3	0 – 1.0	0.1	4.5B– 5.8	2.1
42 to 49	4	3	4	1.1– 2.1	1.5	0 – 0.2	.1	0 – 0.9	.4
Tot.	92	25	57	1.1–13.2	4.0	0 – 1.0	.1	4.5B– 5.8	2.1
				N-P Mixtures					
4–16–0	1	1	1	—	4.3	—	4.7	—	4.8
6–24–0	1	1	1	—	2.1	—	.1	—	41.1
6–12–0	1	1	1	—	27.7	—	3.0	—	27.9
10–20–0	7	3	7	2.0– 5.1	2.9	0 – 0.7	.3	9.0 –58.0	41.4
				P-K Mixtures					
0–12–12	8	5	8	2.3–24.4	11.0	0 –24.1	8.8	32.4B– 1.6	15.3B
0–14–14	1	1	1	—	2.2	—	1.5	—	3.2B
0–20–20	3	3	3	1.9– 3.7	2.7	0.1– 0.5	.3	0.5B– 6.8B	3.8B
0–14–7	7	7	6	5.9–19.2	12.2	0 – 4.3	2.3	16.1B– 2.1	5.0B
0–20–10	3	3	3	2.8– 3.8	3.4	0.1–25.0	8.5	1.0B–32.0B	11.6B
0–30–15	1	1	1	—	7.9	—	4.5	—	8.6B
				N-P-K Mixtures					
2–12–6	51	5	26	1.4–38.4	17.8	0 –88.3	9.2	61.4B–16.1	.8
3–18–9	4	3	4	2.5–12.5	4.5	0.2– 0.4	.3	4.3 – 6.2	5.5
4–24–12	4	3	4	2.1– 4.3	2.7	0.2–13.7	3.8	6.7 – 9.2	4.6
3–9–6	22	4	18	4.1–58.8	29.9	0.8–26.8	13.4	22.1B–13.9	3.2B
4–12–8	9	5	8	4.3–11.7	7.5	0.2–20.8	6.0	10.4B–23.6	10.8
5–15–10	2	2	2	2.9– 3.0	2.9	5.0– 5.1	5.1	3.5 –14.0	8.8
3–9–9	2	2	2	11.3–33.1	22.0	14.8–16.1	15.4	7.5B– 3.0	2.3B
5–15–15	1	1	1	—	4.0	—	4.9	—	8.2
3–12–6	27	6	17	3.4–24.6	14.9	0.2–27.4	7.1	22.1B–18.6	3.4
4–16–8	3	2	3	2.6– 5.2	4.1	0.5– 1.8	1.0	11.2 –15.5	13.4
6–24–12	1	1	1	—	5.1	—	.2	—	11.8
3–12–12	17	5	12	3.0–50.7	11.2	0.2– 8.8	2.4	0.8 –20.9	9.9
5–20–20	1	1	1	—	1.8	—	.3	—	8.5
4–4–4	1	1	1	—	66.9	—	50.7	—	38.1
6–6–6	1	1	1	—	11.3	—	32.1	—	52.5
7–7–7	2	2	2	6.5– 9.5	8.0	25.7–41.3	33.6	15.2 –46.7	31.0
8–8–8	6	4	5	2.4–21.6	11.6	0.2–40.0	10.5	56.2 –76.0	67.9
9–9–9	1	1	1	—	7.2	—	11.5	—	57.8
10–10–10	4	3	4	1.9– 3.4	2.9	0.3–10.4	3.4	48.6–100.0	77.4
4–4–8	3	1	3	9.8–120.5	69.7	0.9– 1.2	1.1	21.9 –62.8	39.6
6–6–12	1	1	1	—	12.0	—	3.1	—	37.2
4–6–8	2	1	2	33.5–41.5	37.5	2.5– 3.6	3.1	20.9 –25.2	23.1
6–9–12	4	1	4	5.8– 9.0	6.9	0.7–13.0	6.6	23.2 –42.2	32.3
8–12–16	1	1	1	—	2.6	—	.2	—	45.8
4–8–4	2	2	2	63.0–71.2	67.1	1.4– 2.3	1.9	21.7 –30.8	26.2
5–10–5	27	11	20	3.8–40.6	18.7	0 –38.2	11.9	21.5B–50.5	14.8
6–12–6	1	1	1	—	11.3	—	.2	—	32.1
4–8–8	4	3	4	29.5–66.4	57.2	0.3– 1.9	.9	19.7 –30.0	23.8
5–10–10	18	9	14	3.8–28.5	13.4	0.2–23.2	5.7	0.4 –38.2	23.2
6–12–12	1	1	1	—	2.5	—	1.8	—	35.5
8–16–16	3	3	3	1.9–13.6	5.8	0.1– 0.3	.3	12.5 –44.5	25.7
6–3–6	3	2	3	14.8–30.4	24.2	18.6–90.7	57.8	80.0B–15.4B	40.9B
8–4–8	1	1	1	—	5.8	—	15.2	—	31.2
8–8–4	2	1	1	4.4–32.0	18.2	0 – 0.8	.4	84.3 –98.5	91.6
10–10–5	3	2	3	4.1–36.0	16.0	0 – 1.6	.9	95.0–109.2	102.6

[1]B, nonacid forming.

With one exception, the 4-16-0 grade, the average single-strength mixture contained from 2.5 to 16 times as much acid-insoluble ash as would normally be associated with its phosphorus content. Six of the principal grades—2-12-6,

3-9-6, 3-12-6, 3-12-12, 5-10-5, and 5-10-10—contained 2.6 to 7 times as much ash as the equivalent superphosphate. The data indicate that it would be possible in many cases to formulate higher-analysis grades of the same plant-nutrient ratio without the use of concentrated superphosphates, and that such a practice would appreciably reduce the necessity for the addition of make-weight material. In other cases this desirable objective could be accomplished by partial replacement of normal superphosphate with triple superphosphate.

Data further indicate that in general the acid-forming quality of the mixtures increases and the carbonate content decreases as formulation proceeds from single- to multiple-strength mixtures.

Economic Significance

As indicated in Table 1, the average mixed fertilizer marketed in 1949–50 contained 196 pounds of acid-insoluble ash and 109 pounds of $CaCO_3$ equivalent per ton. Similarly, the average normal superphosphate contained 89 pounds of ash and three pounds of carbonates per ton. Scholl and Wallace[5] reported that 12,047,379 tons of mixtures containing 1,429,917 tons of total P_2O_5 were marketed in the same season. Based on the figure for acid-insoluble ash content, the mixtures marketed in 1949–50 contained 1,180,643 tons of insoluble ash of which 306,646 tons normally would be associated with the superphosphate equivalent. Thus, a net of 873,997 tons of ash are estimated being added as make-weight material in preparing the mixtures.

Based on the carbonate contents of the mixtures and of the superphosphates, it is estimated that 646,215 tons of $CaCO_3$ equivalent also were added during mixing operations. These estimates of 873,997 tons of acid-insoluble ash and 646,215 tons of $CaCO_3$ equivalent appear to be on the conservative side because they do not include any quantities of these materials that may have been used in formulating the superphosphates to grade from run-of-pile production.

Clark and Bear[2] estimated that manufacturing and distribution cost of mixed fertilizers in the South Atlantic states in 1946 was $12.95 a ton in excess of the value of their content of primary plant nutrients. Under present conditions this cost is estimated to be $16 or more per ton.

Using this figure, cost to consumer of the acid-insoluble ash added to mixed fertilizers in 1949–50 amounted to $13,983,952 (873,997 x $16). It is generally recognized that incorporation of sufficient liming material to render mixtures non-acid forming serves a useful purpose in some parts of the country, notably the South and Southeast. Assigning a value of $3.50 per ton of $CaCO_3$ equivalent for this purpose, the net manufacturing and distribution cost of the 646,215 tons of $CaCO_3$ equivalent added to the mixtures amounted to $8,077,688 (646,215 x $12.50). The total cost to the consumer, therefore, for the 1,520,212 tons of acid-insoluble ash and $CaCO_3$ equivalent in excess of any plant-nutrient value amounted to $22,061,640, or $1.83 per ton of mixed fertilizer.

In consequence it is apparent that a substantial annual reduction in the unit cost of primary plant nutrients in mixed fertilizers could result if the consumer limited his purchases to those grades which do not require in their formulation excessive quantities either of carbonates or of inert materials as filler.

Summary

A survey of 92 superphosphates and 425 mixed fertilizers marketed in 25 states during the 1949–50 fertilizer season showed that the average superphosphate contained 89 pounds of acid-insoluble ash and three pounds of $CaCO_3$ equivalent per ton. The average mixed fertilizer contained 196 and 109 pounds of acid-insoluble ash and $CaCO_3$ equivalent, respectively, per ton of mixture. Comparison of a number of single- and multiple-strength grades of mixtures indicated that in many cases formulation of higher-analysis mixtures of the same plant-nutrient ratio appreciably reduced the necessity for addition of make-weight material. In some instances formulation of the higher-analysis mixtures required the partial or complete replacement of normal superphosphate with triple superphosphate.

Annual Savings

The manufacturing and distribution cost of 1,520,212 tons of acid-insoluble ash and $CaCO_3$ equivalent, estimated as added to the 12,047,379 tons of mixed fertilizers marketed in 1949–50, amounted to $22,061,640 or $1.83 per ton of mixed fertilizer. Annual savings of a considerable proportion of this amount could be made if the consumer were to limit his purchases to those grades which can be formulated without the excessive use of such materials.

Grateful acknowledgment is made to the several state fertilizer control officials whose wholehearted cooperation made this survey possible, and to A. L. Mehring, and K. D. Jacob of this Division, and Stacy B. Randle, State Chemist of New Jersey, for design of the survey ◆

This is the second and final portion of the survey on mixed fertilizers in the United States. In last month's Farm Chemicals *we presented part one of the survey, by Mr. Clark and W. M. Hoffman, associate chemist, Division of Fertilizer and Agricultural Lime. Selection of samples was made from each major geographical region in a manner designed to make the survey as representative as possible.*

LITERATURE CITED

1. Assoc. Official Agr. Chem., Official Methods of Analysis, 7th ed., 1950.
2. K. G. Clark and Firman E. Bear. Use of Natural Organics in Mixed Fertilizers. Amer. Fert. 108(3): 7-10, 24, 26, 28, 30, 1948.
3. ———— and W. M. Hoffman. Forms and Solubility of Phosphorus in Mixed Fertilizers. Farm Chemicals 115(5): 17–20, 21, 23, 1952.
4. ————, L. F. Rader, Jr., and H. R. Walls. Report on Inert Materials in Fertilizers. Jour. Assoc. Official Agr. Chem. 32(4): 691–697, 1949.
5. Walter Scholl and H. M. Wallace. Commercial Fertilizers—Consumption in the United States 1949–50. Com. Fert. 82(6):21–22, 24–25, 27–28, 30–32, 1951; Agr. Chemicals 6 (6): 31–37, 1951.

If your product fits into a bag — we'll make the bag to fit your product.

Pesticide growth in a "nutshell"

Micro-Grinding Plant

By I. Shyke

INCREASED demand for pesticides in the last few years has stimulated growth of a special micro-grinding processing branch of the Grange League Federation in Middletown, N. Y.

Spurred by the nationwide pesticide boom, the federation established the division in 1947 to supply increased needs in the Northeast area of the country, particularly in New York, New Jersey and the northern portion of Pennsylvania.

Results of the new unit have surprised even the federation officials who planned it. Production of farm chemicals has increased 500 per cent until today an annual total of 1,400 tons of dusts and sprays is formulated.

Most activity of the unit is concerned with grinding DDT and sulfur, according to Richard McCargo, manager of the Middletown division. Distribution of the chemicals is made through 600 retail outlets in the three-state area. No retail sales are made from the plant itself.

A study of the Middletown plant —its construction, process system and equipment—is an excellent example of growth of a small plant in a typical small city paralleling the growth of the industry as a whole.

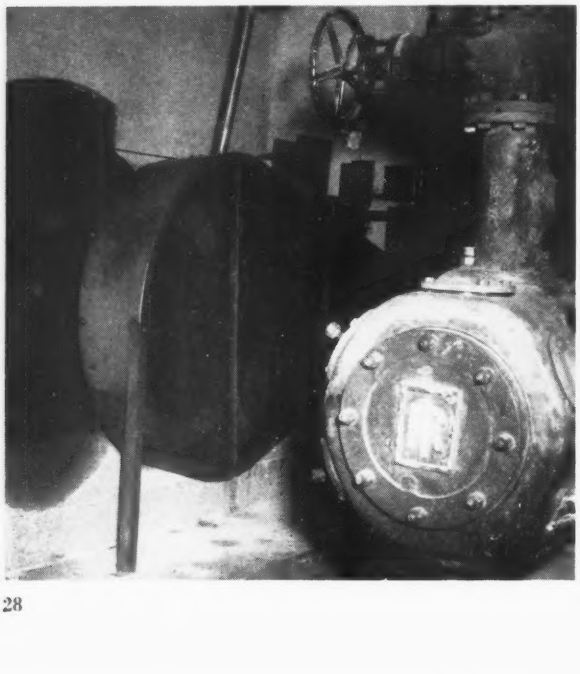
Physical property of the special section of the federation includes a concrete and steel main warehouse, two brick structures for compressors and storage and a pesticide storage house of wood. All buildings are one story in height and are located on a property with a frontage of 300 feet and a depth of 200 feet.

Raw materials are brought into the plant from such companies as General Chemical Division, Tobacco By-Products and Chemical Corporation, American Chemical and Paint Company, American Cyanamid and Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.

Two grades of spray materials are manufactured in the plant from DDT and sulfur. The dusting variety and wettable powder are manufactured and packaged in 50-pound bags.

First step in the micro-grinding

Two views of the compressor room of the GLF micro-grinding plant in Middletown, N. Y. Photo at left shows two Ingersoll Rand compressors, with output of 600 cubic feet a minute at 100 pound pressure. At right, another view of the system.



process is an air-grind operation performed by two Ingersoll Rand compressors with 100 horsepower individual Crocker Wheeler electric motors. Output at the first stage is 600 cublic feet a minute at 100 pounds pressure.

A special apparatus, said to be unique in the pesticide field, is the combination Day mixer used in the second phase of the operation. In interlinked operation are preliminary, secondary and final mixers and an air mill grinder. The Day mixing combination is 30 feet high and 20 feet square at its base. Capacity is 500 pounds of mix in a half hour. Varied conditions prevail which influence capacity, however, and during an average day, according to the manager, from three to three-and-a-half tons of mix are prepared. The entire process is explosion proof.

Storage of the finished chemicals amounts approximately to 50 to 70 tons, with regular replacements. Stock is stored in barrels of from one-half to five-gallon capacity. Products include antiseptic ointment, Carbolineum and Cyanogas wood preservatives, housefly, farm and stock sprays. Several types of soap powders, lice powders, fumigants and farm disinfectants.

Stock on hand, following processing, totals approximately 108 tons of DDT and the same quantity of sulfur. These materials are kept in Kraft bags of 3, 4, 5, 10 and 40-pound weight, and cardboard containers.

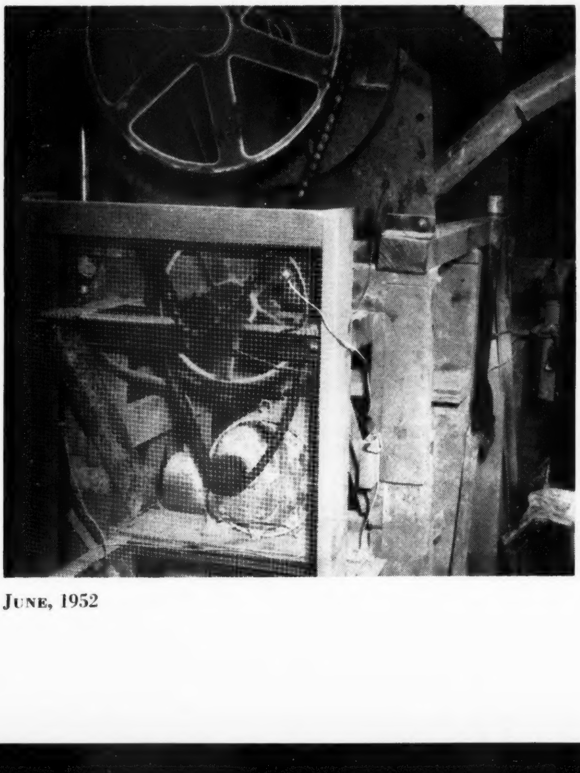
The micro-grinding process for pesticidal materials naturally must adhere to microscopic measurements. These are checked carefully by Grange League experts in the firm's main offices in Ithaca.

McCargo credits constant advertising, special promotions and good service for excellent trade which has been stimulated in the area.

He said advertising emphasizes the value of using sprays for bigger crops, better pastures and savings in manpower. The federation also makes available booklets and folders describing products. ◆

A unique mixing apparatus is employed in the Grange League Federation plant. Pictured is part of the Day mixing unit with air mill at right.

Photo at left shows another view of Day mixer and air mill used in micro-grinding process. At right is a view of the packaging room showing a Silver Stitcher and bag containers. Both paper bags and cardboard boxes are used at the plant.



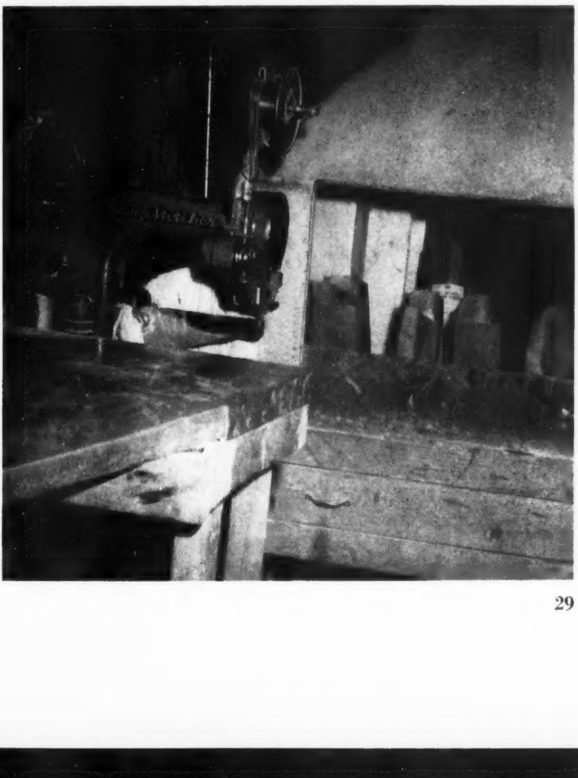


Table 1.—Summary of Acid-Insoluble Ash and $CaCO_3$ Equivalent Contents, and Acid- or Nonacid-Forming Quality of Superphosphates and Mixed Fertilizers, by Regions.

Region	Samples: No.	Samples: States	Samples: Mfrs.	Samples: Average Grade	Acid-Insol. Ash: Range	Acid-Insol. Ash: Mean	$CaCO_3$ Equiv. of Carbonate Carbon: Range	$CaCO_3$ Equiv. of Carbonate Carbon: Mean	Acid- or Nonacid-Forming Quality[1]: Range	Acid- or Nonacid-Forming Quality[1]: Mean
		No.	No.	Per cent			Pounds per ton			
New England										
Superphos., 19–20 per cent	12	3	9	0 –19.50– 0	45–176	95	0– 6	2	10 – 57	37
All mixtures	34	3	18	5.38– 9.76–10.44	33–487	112	2–475	111	270B–610	167
N-P mixtures	1	1	1	4 –10 – 0	—	294	—	132	—	31
P-K mixtures	3	3	3	0 –18 –18	33– 76	49	2– 23	10	48B–139B	91B
N-P-K mixtures	30	3	17	5.97– 8.93–10.03	24–487	117	3–475	120	270B–610	198
Mid. Atlantic										
Superphos., 19–20 per cent	17	4	13	0 –19.76– 0	57–155	92	0– 5	1	28 – 94	44
All mixtures	50	4	26	4.08–11.04– 7.54	20–519	182	0–360	71	293B–857	157
P-K mixtures	2	2	9	0 –14 – 7	222–287	254	0– 25	13	42B– 78B	60B
N-P-K mixtures	48	4	26	4.25–10.92– 7.56	20–519	179	2–360	73	293B–857	166
S. Atlantic										
Superphos., 18–20 per cent	15	4	11	0 –18.87– 0	63–273	117	0– 18	4	4B– 75	47
All mixtures	122	4	56	4.14– 8.38– 6.32	11–787	272	2–704	128	423B–786	55
N-P mixtures	1	1	1	4 –16 – 0	—	78	—	84	—	86
N-K mixtures	5	3	4	10.40– 0 –10.40	17–306	178	10–704	255	269B–786	190
P-K mixtures	1	1	1	0 –12 –12	—	71	—	315	—	423B
N-P-K mixtures	115	4	54	3.90– 8.64– 6.15	11–787	280	2–450	121	233B–507	53
E. S. Central										
Superphos., 18–20 per cent	11	3	11	0 –19.64– 0	46–219	87	0– 7	2	12 – 91	52
All mixtures	48	3	26	4.38– 9.73– 5.54	39–521	171	4–511	202	240B–603	61
P-K mixtures	2	1	2	0 –13.00– 9.50	89–178	134	60–147	103	193B–240B	216B
N-P-K mixtures	46	3	25	4.57– 9.59– 5.37	39–521	173	4–511	207	225B–603	73
W. S. Central										
Superphos., 20 per cent	8	2	7	0 –20.00– 0	43– 89	67	0– 4	1	39 –101	67
All mixtures	23	2	16	5.17–10.35– 4.96	31–586	234	0–494	70	159B–1069	301
N-P mixtures	2	1	2	8.00–11.00– 0	31–346	189	2– 37	20	349 –1069	709
P-K mixtures	1	1	1	0 –14 – 7	—	141	—	1	—	6B
N-P-K mixtures	20	2	15	5.15–10.10– 5.35	31–586	243	0–494	79	159B–704	276
E. N. Central										
Superphos., 20 per cent	12	3	9	0 –20.00– 0	48–109	75	0– 20	5	5B– 59	28
All mixtures	81	3	33	2.36–12.69– 9.00	19–669	168	0–1155	96	805B–708	52
P-K mixtures	12	3	9	0 –14.00–13.00	27–319	122	0–155	53	363B– 31	110B
N-P-K mixtures	69	3	33	2.77–12.43– 8.30	19–669	176	0–1155	103	805B–708	81
W. N. Central										
Superphos., 20 per cent	6	2	6	0 –20.00– 0	40– 82	62	0– 19	4	94B– 64	21
Superphos., 46–49 per cent	2	1	2	0 –47.50– 0	50– 63	56	0– 5	3	4 – 33	19
All mixtures	30	2	17	3.60–14.97– 8.60	31–466	162	1–534	67	668B–1036	137
P-K mixtures	3	2	3	0 –21.33–10.67	59–233	165	1–534	185	55B–668B	262B
N-P-K mixtures	27	2	16	4.00–14.26– 8.37	31–466	162	1–337	54	166B–1036	181
Mountain										
Superphos., 17–18 per cent	3	2	3	0 –17.67– 0	75–105	86	0– 4	2	42 –121	73
Superphos., 42 per cent	1	1	1	0 –42 – 0	—	98	—	10	—	42
All mixtures	20	2	11	9.30–14.35– 1.15	30–337	100	0–500	61	59 –1534	836
N-P mixtures	16	2	10	10.06–14.56– 0	30–154	79	0–500	57	191 –1534	906
N-P-K mixtures	4	2	4	6.50–13.50– 5.75	67–337	185	2–284	75	59 –1104	555
Pacific										
Superphos., 18–20 per cent	4	2	4	0 –18.50– 0	73–117	91	0– 3	1	19 – 49	40
Superphos., 46 per cent	1	1	1	0 –46 – 0	—	74	—	6	—	2B
All mixtures	17	2	14	8.59– 9.65– 5.76	17–761	183	0–309	58	96B–1820	739
N-P mixtures	3	1	3	14.67–11.33– 0	44–169	79	1–165	60	841 –1820	1244
N-P-K mixtures	14	2	12	7.29– 9.29– 7.00	17–761	203	0–309	57	96B–1623	631
United States										
Superphos., 17–20 per cent	88	25	53	0 –19.50– 0	40–273	89	0– 20	3	94B–121	44
Superphos., 42–49 per cent	4	3	4	0 –45.75– 0	50– 98	71	0– 10	5	2B– 42	19
All mixtures	425	25	157	4.38–10.72– 7.06	11–787	196	0–1155	109	805B–1820	159
N-P mixtures	23	6	16	9.96–13.70– 0	30–346	99	0–500	59	31 –1820	859
N-K mixtures	5	3	4	10.40– 0 –10.40	17–306	178	10–704	255	269B–786	190
P-K mixtures	24	13	19	0 –15.25–13.08	27–319	129	0–534	74	668B– 31	140B
N-P-K mixtures	373	25	145	4.23–10.39– 7.06	11–787	207	0–1155	112	805B–1623	135

[1]B, nonacid forming.

Table 2.—Summary of Acid-Insoluble Ash and $CaCO_3$ Equivalent Contents, and Acid- or Nonacid-forming Quality of Normal Superphosphates and Principal Grades of Mixed Fertilizers.

Grade	Samples: No.	Samples: States	Samples: Mfrs.	Acid-Insoluble Ash: Range	Acid-Insoluble Ash: Mean	$CaCO_3$ Equiv. of Carbonate Carbon: Range	$CaCO_3$ Equiv. of Carbonate Carbon: Mean	Acid- or Nonacid-forming Quality[1]: Range	Acid- or Nonacid-forming Quality[1]: Mean
				Pounds per ton					
				Superphosphates					
17 to 20	88	25	53	40–273	89	0–20	3	94B–121	44
				Mixtures					
2–12–6	51	5	26	19–502	133	0–1155	120	805B–211	10
3–9–6	22	4	18	42–599	305	8–273	140	225B–142	33B
3–12–6	27	6	17	45–325	196	3–360	93	293B–245	45
3–12–12	17	5	12	40–669	147	2–116	31	11–275	130
4–8–6	16	2	18	61–688	435	2–348	95	206B–333	98
4–10–6	25	3	16	79–454	227	49–304	155	200B–88	4
4–10–7	10	3	8	46–470	224	8–339	132	110B–265	55
4–12–4	17	6	13	65–300	183	2–342	78	168B–370	155
5–10–5	27	11	20	41–441	202	0–414	128	233B–546	160
5–10–10	18	9	14	42–313	147	2–256	63	4–420	255
6–8–4	12	2	9	39–135	80	261–511	395	174B–136	16B

[1]B, nonacid forming.

Table 3.—Distribution of Mixed Fertilizers in Relation to Content of Acid-Insoluble Ash, and Sum of Ash Content and $CaCO_3$ Equivalent of Carbonate Carbon.

Acid-insoluble ash, pounds per ton	Acid-insoluble ash plus $CaCO_3$ equivalent of carbonate carbon, pounds per ton: 0–100	101–200	201–300	301–400	401–500	501–600	601–700	701–800	801–900	901–1000	1101–1200	Tot.
	Per cent of total samples											
0–100	14.6	8.2	4.9	5.6	2.1	1.4	—	0.2	—	—	0.5	37.6
101–200	—	7.1	4.0	6.6	1.2	.2	0.2	—	—	—	—	19.3
201–300	—	—	9.6	7.5	2.8	.9	—	—	—	—	—	20.9
301–400	—	—	—	7.5	2.8	1.2	.2	.2	—	—	—	12.0
401–500	—	—	—	—	2.4	1.9	.2	—	—	—	—	4.5
501–600	—	—	—	—	—	1.9	1.6	—	—	—	—	3.5
601–700	—	—	—	—	—	—	1.4	.2	—	—	—	1.6
701–800	—	—	—	—	—	—	—	.5	—	—	—	.5
Tot.	14.6	15.3	18.6	27.3	11.3	7.5	3.8	1.1	—	—	.5	100.0

$CaCO_3$ equivalent, and exhibited the highest average acid-forming quality, 859 pounds per ton. N-K mixtures contained somewhat less acid-insoluble ash, somewhat more $CaCO_3$ equivalent, and were slightly more acid-forming than the average of all mixtures.

P-K mixtures contained less than the average acid-insoluble ash and $CaCO_3$ equivalent, and were generally non-acid forming. The N-P-K mixtures exhibited the highest observed values for acid-insoluble ash, $CaCO_3$ equivalent, and non-acid-forming quality.

The data are summarized in relation to the principal grades and to normal superphosphates in Table 2. Wide variations in ash and carbonate contents, and in net acid-base balance were noted for all grades listed. In comparison with superphosphate the mixtures contained considerable quantities either of acid-insoluble ash, carbonate equivalent, or both.

Table 3 shows distribution of the samples with respect to acid-insoluble ash content, sum of ash content and $CaCO_3$ equivalent, and the interrelation of these quantities. Three-eighths of the samples (37.6 per cent, 160 samples) contained less than 100 pounds of acid-insoluble ash per ton, and only about three-eighths of these

Table 4.—Distribution of Mixed Fertilizers in Relation to Content of $CaCO_3$ Equivalent of Carbonate Carbon and Acid- or Nonacid-forming Quality.

$CaCO_3$ equiv. of carbonate carbon, lbs. per ton		Acid- or nonacid-forming quality, lbs. per ton[1]: 0–100	101–200	201–300	301–400	401–500	501–600	601–700	701–800	801–900	901–1000	1001–1100	1101–1200	1201–1300	1501–1600	1601–1700	1801–1900	Total: Sub-tot.	Total: Tot.
		Per cent of total samples																	
0–100	A	14.1	14.6	10.6	3.8	2.4	0.9	1.2	1.6	1.2	0.2	1.2	0.9	0.5	0.2	0.2	0.2	53.9	60.5
	B	5.2	1.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.6	—
101–200	A	8.9	1.4	.7	.9	—	.7	.2	—	—	—	.2	—	—	—	—	—	13.2	21.4
	B	6.6	1.2	.5	—	—	—	—	—	—	—	—	—	—	—	—	—	8.2	—
201–300	A	1.4	.9	.5	.2	—	—	—	—	—	—	—	—	—	—	—	—	3.1	8.9
	B	2.6	2.6	.5	.2	—	—	—	—	—	—	—	—	—	—	—	—	5.9	—
301–400	A	.7	.2	—	—	—	—	—	.2	—	—	—	—	.2	—	—	—	1.4	5.6
	B	1.9	.9	1.2	—	.2	—	—	—	—	—	—	—	—	—	—	—	4.2	—
401–500	A	.2	—	.2	—	—	.2	—	—	—	—	—	—	—	—	—	—	.7	2.4
	B	.9	.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.6	—
501–600	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.5
	B	.2	—	—	—	—	—	.2	—	—	—	—	—	—	—	—	—	.5	—
701–800	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	.2	—	—	—	—	—	—	—	—	—	—	—	—	—	.2	—
1001–1100	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	—	—	—	—	—	.2	—	—	—	—	—	—	—	—	.2	—
1101–1200	A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.2
	B	—	—	—	—	—	—	—	—	.2	—	—	—	—	—	—	—	.2	—
Sub-tot.	A	25.4	17.2	12.0	4.9	2.4	1.9	1.4	1.9	1.2	.2	1.4	.9	.7	.2	.2	.2	72.2	100.0
	B	17.4	6.8	2.4	.2	.2	—	.2	.2	.2	—	—	—	—	—	—	—	27.8	—
Tot.		42.8	24.0	14.4	5.2	2.6	1.9	1.6	2.1	1.4	.2	1.4	.9	.7	.2	.2	.2	100.0	—

[1]A, acid forming; B, nonacid forming.

(62 samples) exhibited a sum of ash and carbonate equivalent of less than 100 pounds.

Fifty per cent (80 samples) exhibited a sum of 100 to 400 pounds, 10 per cent (16 samples), a sum between 400 and 800 pounds, and 0.5 per cent (2 samples) more than 1100 pounds. More than one-half of the samples (52.2 per cent, 222 samples) contained 100 to 400 pounds of ash and of these 18.9 per cent (42 samples) contained 400 to 800 pounds of ash plus carbonate equivalent. Approximately 10 per cent of the samples, 43, contained 400 to 800 pounds of ash and of these at least 40 per cent, 17, also contained appreciable amounts of carbonate.

Distribution of Samples

Distribution of the samples with respect to $CaCO_3$ equivalent, net acid-base balance, and the interrelation of these quantities is given in Table 4. One hundred and eighteen or 27.8 per cent of the samples were non-acid forming compared with 168, 39.5 per cent, which contained more than 100 pounds of carbonate equivalent per ton and 77, 18.1 per cent, which contained in excess of 200 pounds. Of the 168 samples containing more than 100 pounds of carbonate per ton 78, 46.4 per cent, were acid forming and 90, 53.6 per cent, non-acid forming. Nearly 55 per cent or 232 samples were acid forming in the range 0–300 pounds per ton compared with 26.6 per cent, 113, that were non-acid forming in the same range. A little more than one per cent of the samples, 5, were non-acid forming in excess of 300 pounds and 17.6 per cent, 75, were acid-forming in this range.

Inasmuch as superphosphate is the principal phosphorus source used in formulating mixtures and also the principal ingredient normally carrying an appreciable acid-insoluble ash content, a comparison of the ash content of mixtures and of superphosphates in relation to their phosphorus content provides an approximate measure of the inert inorganic material that was added.

Such a comparison is presented in Table 5 for those phosphorus-containing mixtures collected in both single- and multiple-strength grades. Similar comparative data also are given for $CaCO_3$ equivalent of carbonate carbon and net acid-base balance. Although these quantities are more closely related to nitrogen content than to the phosphorus in the mixtures, the values for grades having the same plant-nutrient ratio are in approximately the same proportion in either case.

With one exception, the 4-16-0 grade, the average single-strength mixture contained from 2.5 to 16 times as much acid-insoluble ash as would normally be associated with its phosphorus content. Six of the principal grades—2-12-6,

Table 5.—Comparison of Acid-Insoluble Ash and $CaCO_3$ Equivalent of Carbonate-Carbon Contents, and Acid- or Nonacid-forming Quality of Single- and Multiple-Strength Grades of Superphosphates and Mixed Fertilizers.

	Samples			Acid-insol. ash		$CaCO_3$ Equiv. of Carbonate Carbon		Acid- or Nonacid-forming Quality[1]	
Grade	No.	States	Mfrs.	Range	Mean	Range	Mean	Range	Mean
				Pounds per unit of total P_2O_5					
				Superphosphates					
17 to 20	88	25	53	1.9–13.2	4.3	0 – 1.0	0.1	4.5B– 5.8	2.1
42 to 49	4	3	4	1.1– 2.1	1.5	0 – 0.2	.1	0 – 0.9	.4
Tot.	92	25	57	1.1–13.2	4.0	0 – 1.0	.1	4.5B– 5.8	2.1
				N-P Mixtures					
4–16–0	1	1	1	—	4.3	—	4.7	—	4.8
6–24–0	1	1	1	—	2.1	—	.1	—	41.1
6–12–0	1	1	1	—	27.7	—	3.0	—	27.9
10–20–0	7	3	7	2.0– 5.1	2.9	0 – 0.7	.3	9.0 –58.0	41.4
				P-K Mixtures					
0–12–12	8	5	8	2.3–24.4	11.0	0 –24.1	8.8	32.4B– 1.6	15.3B
0–14–14	1	1	1	—	2.2	—	1.5	—	3.2B
0–20–20	3	3	3	1.9– 3.7	2.7	0.1– 0.5	.3	0.5B– 6.8B	3.8B
0–14–7	7	7	6	5.9–19.2	12.2	0 – 4.3	2.3	16.1B– 2.1	5.0B
0–20–10	3	3	3	2.8– 3.8	3.4	0.1–25.0	8.5	1.0B–32.0B	11.6B
0–30–15	1	1	1	—	7.9	—	4.5	—	8.6B
				N-P-K Mixtures					
2–12–6	51	5	26	1.4–38.4	17.8	0 –88.3	9.2	61.4B–16.1	.8
3–18–9	4	3	4	2.5–12.5	4.5	0.2– 0.4	.3	4.3 – 6.2	5.5
4–24–12	4	3	4	2.1– 4.3	2.7	0.2–13.7	3.8	6.7 – 9.2	4.6
3–9–6	22	4	18	4.1–58.8	29.9	0.8–26.8	13.4	22.1B–13.9	3.2B
4–12–8	9	5	8	4.3–11.7	7.5	0.2–20.8	6.0	10.4B–23.6	10.8
5–15–10	2	2	2	2.9– 3.0	2.9	5.0– 5.1	5.1	3.5 –14.0	8.8
3–9–9	2	2	2	11.3–33.1	22.0	14.8–16.1	15.4	7.5B– 3.0	2.3B
5–15–15	1	1	1	—	4.0	—	4.9	—	8.2
3–12–6	27	6	17	3.4–24.6	14.9	0.2–27.4	7.1	22.1B–18.6	3.4
4–16–8	3	2	3	2.6– 5.2	4.1	0.5– 1.8	1.0	11.2 –15.5	13.4
6–24–12	1	1	1	—	5.1	—	.2	—	11.8
3–12–12	17	5	12	3.0–50.7	11.2	0.2– 8.8	2.4	0.8 –20.9	9.9
5–20–20	1	1	1	—	1.8	—	.3	—	8.5
4–4–4	1	1	1	—	66.9	—	50.7	—	38.1
6–6–6	1	1	1	—	11.3	—	32.1	—	52.5
7–7–7	2	2	2	6.5– 9.5	8.0	25.7–41.3	33.6	15.2 –46.7	31.0
8–8–8	6	4	5	2.4–21.6	11.6	0.2–40.0	10.5	56.2 –76.0	67.9
9–9–9	1	1	1	—	7.2	—	11.5	—	57.8
10–10–10	4	3	4	1.9– 3.4	2.9	0.3–10.4	3.4	48.6–100.0	77.4
4–4–8	3	1	3	9.8–120.5	69.7	0.9– 1.2	1.1	21.9 –62.8	39.6
6–6–12	1	1	1	—	12.0	—	3.1	—	37.2
4–6–8	2	1	2	33.5–41.5	37.5	2.5– 3.6	3.1	20.9 –25.2	23.1
6–9–12	4	1	4	5.8– 9.0	6.9	0.7–13.0	6.6	23.2 –42.2	32.3
8–12–16	1	1	1	—	2.6	—	.2	—	45.8
4–8–4	2	2	2	63.0–71.2	67.1	1.4– 2.3	1.9	21.7 –30.8	26.2
5–10–5	27	11	20	3.8–40.6	18.7	0 –38.2	11.9	21.5B–50.5	14.8
6–12–6	1	1	1	—	11.3	—	.2	—	32.1
4–8–8	4	3	4	29.5–66.4	57.2	0.3– 1.9	.9	19.7 –30.0	23.8
5–10–10	18	9	14	3.8–28.5	13.4	0.2–23.2	5.7	0.4 –38.2	23.2
6–12–12	1	1	1	—	2.5	—	1.8	—	35.5
8–16–16	3	3	3	1.9–13.6	5.8	0.1– 0.3	.3	12.5 –44.5	25.7
6–3–6	3	2	3	14.8–30.4	24.2	18.6–90.7	57.8	80.0B–15.4B	40.9B
8–4–8	1	1	1	—	5.8	—	15.2	—	31.2
8–8–4	2	1	1	4.4–32.0	18.2	0 – 0.8	.4	84.3 –98.5	91.6
10–10–5	3	2	3	4.1–36.0	16.0	0 – 1.6	.9	95.0–109.2	102.6

[1]B, nonacid forming.

3-9-6, 3-12-6, 3-12-12, 5-10-5, and 5-10-10—contained 2.6 to 7 times as much ash as the equivalent superphosphate. The data indicate that it would be possible in many cases to formulate higher-analysis grades of the same plant-nutrient ratio without the use of concentrated superphosphates, and that such a practice would appreciably reduce the necessity for the addition of make-weight material. In other cases this desirable objective could be accomplished by partial replacement of normal superphosphate with triple superphosphate.

Data further indicate that in general the acid-forming quality of the mixtures increases and the carbonate content decreases as formulation proceeds from single- to multiple-strength mixtures.

Economic Significance

As indicated in Table 1, the average mixed fertilizer marketed in 1949–50 contained 196 pounds of acid-insoluble ash and 109 pounds of $CaCO_3$ equivalent per ton. Similarly, the average normal superphosphate contained 89 pounds of ash and three pounds of carbonates per ton. Scholl and Wallace[5] reported that 12,047,379 tons of mixtures containing 1,429,917 tons of total P_2O_5 were marketed in the same season. Based on the figure for acid-insoluble ash content, the mixtures marketed in 1949–50 contained 1,180,643 tons of insoluble ash of which 306,646 tons normally would be associated with the superphosphate equivalent. Thus, a net of 873,997 tons of ash are estimated being added as make-weight material in preparing the mixtures.

Based on the carbonate contents of the mixtures and of the superphosphates, it is estimated that 646,215 tons of $CaCO_3$ equivalent also were added during mixing operations. These estimates of 873,997 tons of acid-insoluble ash and 646,215 tons of $CaCO_3$ equivalent appear to be on the conservative side because they do not include any quantities of these materials that may have been used in formulating the superphosphates to grade from run-of-pile production.

Clark and Bear[2] estimated that manufacturing and distribution cost of mixed fertilizers in the South Atlantic states in 1946 was $12.95 a ton in excess of the value of their content of primary plant nutrients. Under present conditions this cost is estimated to be $16 or more per ton.

Using this figure, cost to consumer of the acid-insoluble ash added to mixed fertilizers in 1949–50 amounted to $13,983,952 (873,997 x $16). It is generally recognized that incorporation of sufficient liming material to render mixtures non-acid forming serves a useful purpose in some parts of the country, notably the South and Southeast. Assigning a value of $3.50 per ton of $CaCO_3$ equivalent for this purpose, the net manufacturing and distribution cost of the 646,215 tons of $CaCO_3$ equivalent added to the mixtures amounted to $8,077,688 (646,215 x $12.50). The total cost to the consumer, therefore, for the 1,520,212 tons of acid-insoluble ash and $CaCO_3$ equivalent in excess of any plant-nutrient value amounted to $22,061,640, or $1.83 per ton of mixed fertilizer.

In consequence it is apparent that a substantial annual reduction in the unit cost of primary plant nutrients in mixed fertilizers could result if the consumer limited his purchases to those grades which do not require in their formulation excessive quantities either of carbonates or of inert materials as filler.

Summary

A survey of 92 superphosphates and 425 mixed fertilizers marketed in 25 states during the 1949–50 fertilizer season showed that the average superphosphate contained 89 pounds of acid-insoluble ash and three pounds of $CaCO_3$ equivalent per ton. The average mixed fertilizer contained 196 and 109 pounds of acid-insoluble ash and $CaCO_3$ equivalent, respectively, per ton of mixture. Comparison of a number of single- and multiple-strength grades of mixtures indicated that in many cases formulation of higher-analysis mixtures of the same plant-nutrient ratio appreciably reduced the necessity for addition of make-weight material. In some instances formulation of the higher-analysis mixtures required the partial or complete replacement of normal superphosphate with triple superphosphate.

Annual Savings

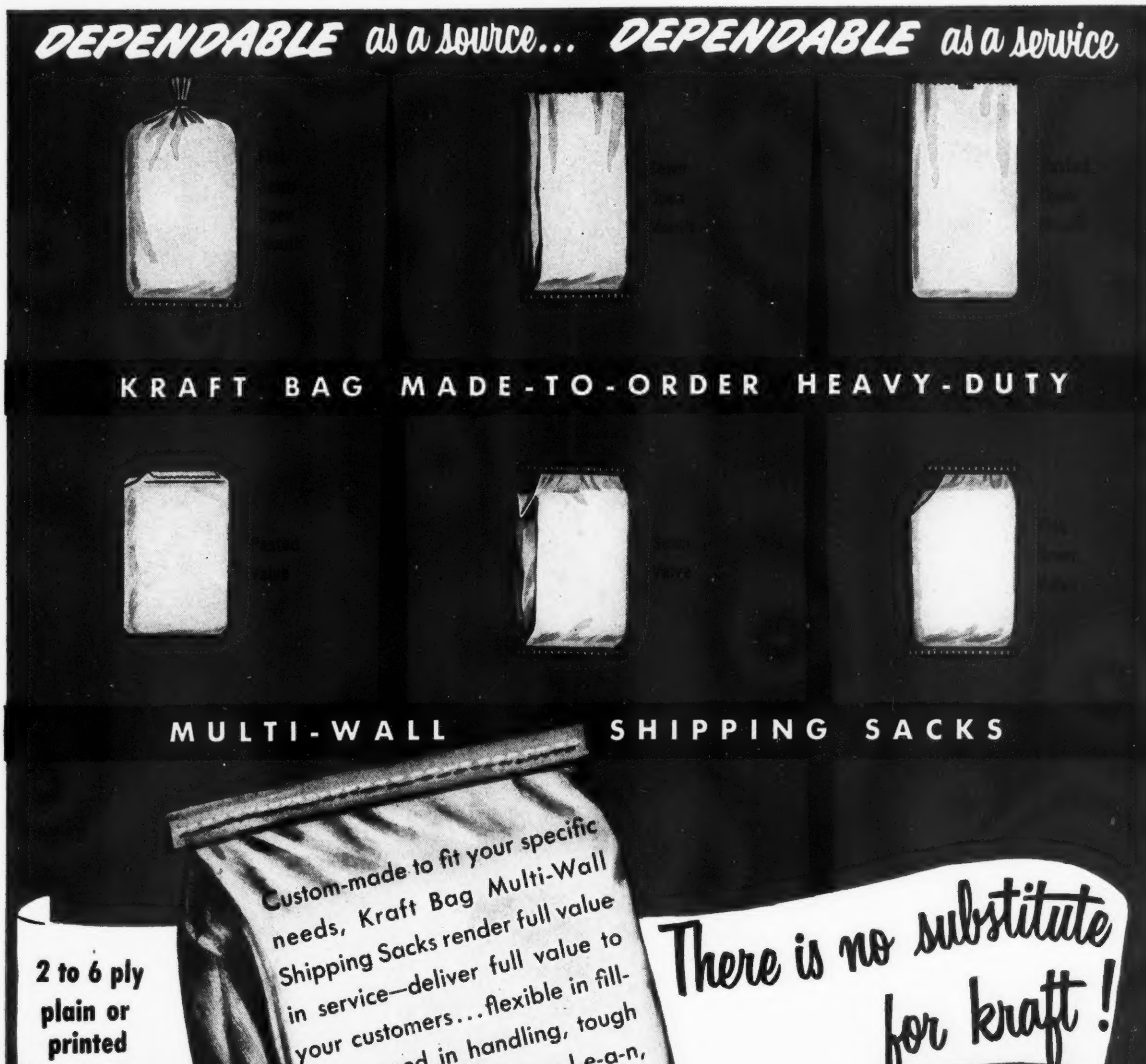
The manufacturing and distribution cost of 1,520,212 tons of acid-insoluble ash and $CaCO_3$ equivalent, estimated as added to the 12,047,379 tons of mixed fertilizers marketed in 1949–50, amounted to $22,061,640 or $1.83 per ton of mixed fertilizer. Annual savings of a considerable proportion of this amount could be made if the consumer were to limit his purchases to those grades which can be formulated without the excessive use of such materials.

Grateful acknowledgment is made to the several state fertilizer control officials whose wholehearted cooperation made this survey possible, and to A. L. Mehring, and K. D. Jacob of this Division, and Stacy B. Randle, State Chemist of New Jersey, for design of the survey ◆

This is the second and final portion of the survey on mixed fertilizers in the United States. In last month's FARM CHEMICALS *we presented part one of the survey, by Mr. Clark and W. M. Hoffman, associate chemist, Division of Fertilizer and Agricultural Lime. Selection of samples was made from each major geographical region in a manner designed to make the survey as representative as possible.*

LITERATURE CITED

1. Assoc. Official Agr. Chem., Official Methods of Analysis, 7th ed., 1950.
2. K. G. Clark and Firman E. Bear. Use of Natural Organics in Mixed Fertilizers. Amer. Fert. 108(3): 7-10, 24, 26, 28, 30, 1948.
3. ———— and W. M. Hoffman. Forms and Solubility of Phosphorus in Mixed Fertilizers. FARM CHEMICALS 115(5): 17–20, 21, 23, 1952.
4. ————, L. F. Rader, Jr., and H. R. Walls. Report on Inert Materials in Fertilizers. Jour. Assoc. Official Agr. Chem. 32(4): 691–697, 1949.
5. Walter Scholl and H. M. Wallace. Commercial Fertilizers—Consumption in the United States 1949–50. Com. Fert. 82(6):21–22, 24–25, 27–28, 30–32, 1951; Agr. Chemicals 6 (6): 31–37, 1951.


DEPENDABLE as a source... DEPENDABLE as a service
KRAFT BAG MADE-TO-ORDER HEAVY-DUTY
MULTI-WALL SHIPPING SACKS
2 to 6 ply plain or printed 1 to 4 colors
Custom-made to fit your specific needs, Kraft Bag Multi-Wall Shipping Sacks render full value in service—deliver full value to your customers... flexible in filling, rugged in handling, tough in transit, they empty c-l-e-a-n, with less dusting or sifting!
3 GENERATIONS OF BAG SPECIALISTS
SELF-CONTAINED • SELF-SUSTAINING
producing our own pulp and paper and other components in our own integrated plants, at Gilman, Vt. and St. Marys, Ga.
There is no substitute for kraft!
Gilman PAPER CO.
• St. Marys Kraft Corp.
• Gummed Tape Div.
• The Cellucord Corp.
• Kraft Bag Corp.
KRAFT BAG CORPORATION
KRAFT BAG CORPORATION
GILMAN PAPER COMPANY SUBSIDIARY
630 Fifth Avenue, New York 20, N.Y.
Daily News Bldg., Chicago 6, Ill.
If your product fits into a bag — we'll make the bag to fit your product.

Pesticide growth in a "nutshell"

Micro-Grinding Plant

By I. Shyke

INCREASED demand for pesticides in the last few years has stimulated growth of a special micro-grinding processing branch of the Grange League Federation in Middletown, N. Y.

Spurred by the nationwide pesticide boom, the federation established the division in 1947 to supply increased needs in the Northeast area of the country, particularly in New York, New Jersey and the northern portion of Pennsylvania.

Results of the new unit have surprised even the federation officials who planned it. Production of farm chemicals has increased 500 per cent until today an annual total of 1,400 tons of dusts and sprays is formulated.

Most activity of the unit is concerned with grinding DDT and sulfur, according to Richard McCargo, manager of the Middletown division. Distribution of the chemicals is made through 600 retail outlets in the three-state area. No retail sales are made from the plant itself.

A study of the Middletown plant —its construction, process system and equipment—is an excellent example of growth of a small plant in a typical small city paralleling the growth of the industry as a whole.

Physical property of the special section of the federation includes a concrete and steel main warehouse, two brick structures for compressors and storage and a pesticide storage house of wood. All buildings are one story in height and are located on a property with a frontage of 300 feet and a depth of 200 feet.

Raw materials are brought into the plant from such companies as General Chemical Division, Tobacco By-Products and Chemical Corporation, American Chemical and Paint Company, American Cyanamid and Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation.

Two grades of spray materials are manufactured in the plant from DDT and sulfur. The dusting variety and wettable powder are manufactured and packaged in 50-pound bags.

First step in the micro-grinding

Two views of the compressor room of the GLF micro-grinding plant in Middletown, N. Y. Photo at left shows two Ingersoll Rand compressors, with output of 600 cubic feet a minute at 100 pound pressure. At right, another view of the system.

process is an air-grind operation performed by two Ingersoll Rand compressors with 100 horsepower individual Crocker Wheeler electric motors. Output at the first stage is 600 cublic feet a minute at 100 pounds pressure.

A special apparatus, said to be unique in the pesticide field, is the combination Day mixer used in the second phase of the operation. In interlinked operation are preliminary, secondary and final mixers and an air mill grinder. The Day mixing combination is 30 feet high and 20 feet square at its base. Capacity is 500 pounds of mix in a half hour. Varied conditions prevail which influence capacity, however, and during an average day, according to the manager, from three to three-and-a-half tons of mix are prepared. The entire process is explosion proof.

Storage of the finished chemicals amounts approximately to 50 to 70 tons, with regular replacements. Stock is stored in barrels of from one-half to five-gallon capacity. Products include antiseptic ointment, Carbolineum and Cyanogas wood preservatives, housefly, farm and stock sprays. Several types of soap powders, lice powders, fumigants and farm disinfectants.

Stock on hand, following processing, totals approximately 108 tons of DDT and the same quantity of sulfur. These materials are kept in Kraft bags of 3, 4, 5, 10 and 40-pound weight, and cardboard containers.

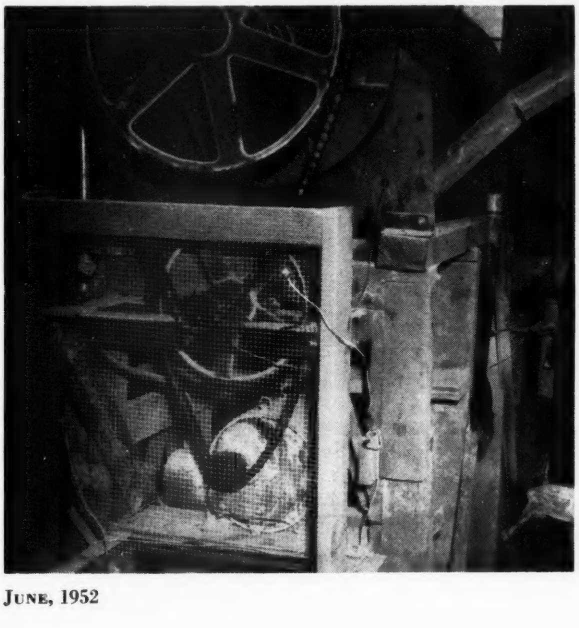
A unique mixing apparatus is employed in the Grange League Federation plant. Pictured is part of the Day mixing unit with air mill at right.

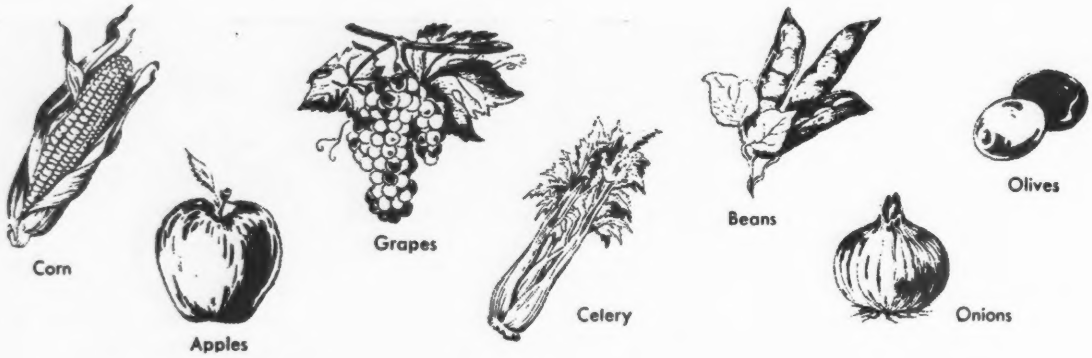
The micro-grinding process for pesticidal materials naturally must adhere to microscopic measurements. These are checked carefully by Grange League experts in the firm's main offices in Ithaca.

McCargo credits constant advertising, special promotions and good service for excellent trade which has been stimulated in the area.

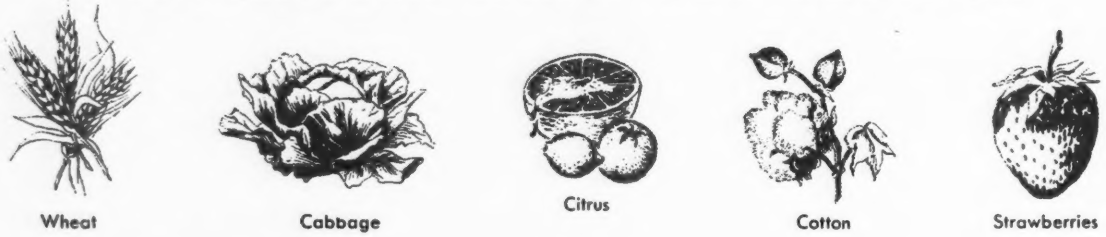
He said advertising emphasizes the value of using sprays for bigger crops, better pastures and savings in manpower. The federation also makes available booklets and folders describing products. ◆

Photo at left shows another view of Day mixer and air mill used in micro-grinding process. At right is a view of the packaging room showing a Silver Stitcher and bag containers. Both paper bags and cardboard boxes are used at the plant.

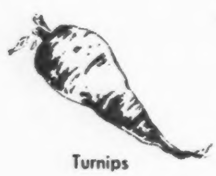




NO MATTER WHAT YOU GROW....



NO MATTER WHERE YOU GROW IT....



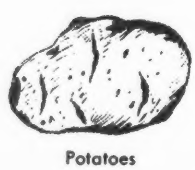
REMEMBER— **PARATHION** KILLS MORE TYPES OF INSECTS ON A BROADER RANGE OF CROPS THAN ANY OTHER INSECTICIDE

Consult your local agricultural authorities
on the advantages of PARATHION insecticides or write for
Parathion Grower's Handbook.

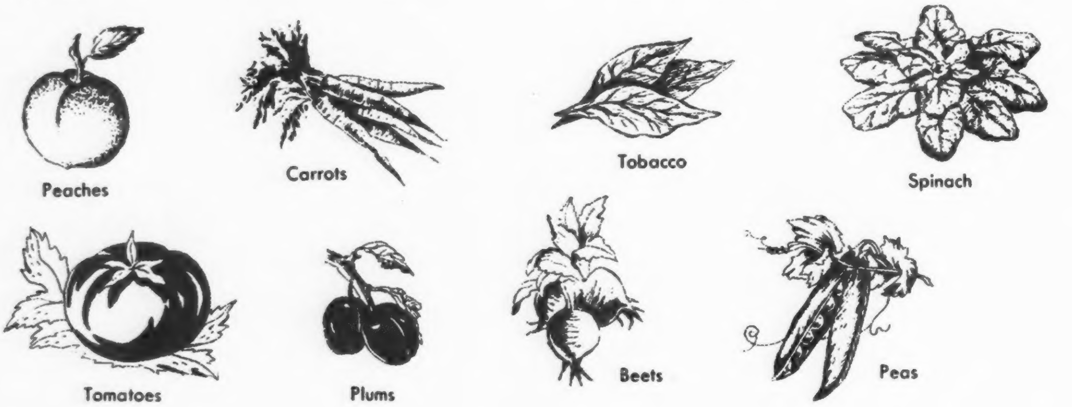
AMERICAN *Cyanamid* COMPANY

Manufacturer of *Thiophos*® Parathion Technical

Agricultural Chemicals Division
30 Rockefeller Plaza, New York 20, N. Y.



AVAILABLE FROM NATIONAL MANUFACTURERS



ATTENTION, DISTRIBUTORS AND DEALERS: Are you taking advantage of the sales opportunities offered by parathion insecticides? If not, get in touch with a manufacturer whose products contain THIOPHOS Parathion. List of manufacturers on request.

FERTILIZER MATERIALS MARKET

New York

May 10, 1952

Sulfate of Ammonia

This material is in extremely tight supply position because of the recent steel strike, and some suppliers have been forced to cut back their customers because of lost production. No relief is expected until the end of the current season.

Nitrate of Soda

With the settlement of the strike in Chile at the nitrate mines, a better supply picture is indicated but it probably will be late in May before any appreciable quantity arrives at U. S. ports.

Ammonium Nitrate

This material is being shipped as fast as produced and is in heavy demand.

Nitrogenous Tankage

A short supply situation is looked for the coming year in this material unless supplies of raw materials are increased considerably during the coming months. Offerings are hard to locate with many inquiries in the market.

Castor Pomace

Limited amount of offerings kept pace with the demand at an unchanged price of $37.25 per ton, f.o.b. production points. Some foreign castor meal is being offered at Southern ports on a competitive basis.

Low Grade Ammoniates

Demand is rather limited at this time for this grade of organics as the mixing season is drawing to a close.

Organics

Organic fertilizer materials were rather dull as the fertilizer season is drawing to a close. Soybean meal is particularly hard to obtain for nearby shipment as most of the mills refuse to accept orders at the ceiling price of $81.00 per ton, f.o.b. Decatur, Ill. Cottonseed meal for nearby shipment was also hard to obtain. Linseed meal was quiet with no offerings, because many plants are shut down because of slow oil business. Tankage is quoted at $6.00 ($7.29 per unit N), f.o.b. New York and blood at the same price.

Fish Meal

Some additiona sales were reported to the feed trade on menhaden fish meal on a "when and if made basis" as the fish factories are getting ready to operate along the Atlantic Coast. Considerable importations of foreign fish meal continue to arrive at various ports.

Bone Meal

A better demand has developed for material for quick shipment from the fertilizer grade but demand from the feed trade has been rather spotty.

Hoof Meal

This market is steady at $7.00 per unit of ammonia ($8.51 per unit N), f.o.b. Chicago, for nearby shipment.

Superphosphate

While tight, no acute shortage has occurred as was predicted some months ago in this material. A recent price rise of about 5 cents per unit granted by the O.P.S. has made the manufacturing end of the business more attractive to the producers who have been faced with constantly increasing costs.

Potash

Producers have petitioned O.P.S. for higher potash prices for the coming season. With the recent increase in domestic freight rates it will make imported material a little more attractive to the buyers pricewise. No contracts are being made for the new season pending settlement of the price situation.

Philadelphia

May 10, 1952

Aside from active demand for sulfate of ammonia, raw materials market is very quiet. The strike in Chile has been settled, helping nitrate of soda supply. Packinghouse products are without interest. Cyanamid prices will be reduced for the new season. Price of normal superphosphate has been advanced in some areas. Potash is moving more freely with better demand.

Sulfate of Ammonia.—As the result of disturbed steel situation, unusually active demand exists for this article. Resale offerings are exceedingly limited, but buyers show no disposition to pay premium prices.

Nitrate of Ammonia.—Production continues heavy but does not keep up with demand.

Nitrate of Soda.—Arrivals are expected within the next week or two.

Cyanamid.—It is expected there will be an ample supply of this material during the coming season, and prices are being reduced to $62.50 per ton for the granular grade, and $2.90 per unit nitrogen for pulverized, effective middle of this month. These prices are for carloads, and at the producing plants in Canada.

Blood, Tankage, Bone.—Blood and tankage continue in a very weak position, with quotations more or less nominal at $5.50 to $6.00 per unit of ammonia ($6.68 to $7.29 per unit N). Bone meal is in slightly better position, with prices unchanged at $80.00 per ton for steamed and $75.00 for raw bone.

Castor Pomace.—Buying interest seems to have subsided. Offerings are reported at $37.25 per ton at producing works.

Fish Scrap.—Market very quiet

with imported goods offered as low as $110.00 per ton, which is well under the ceiling price. Domestic fishing has started in the Gulf and is expected to begin shortly off the Atlantic Coast.

Phosphate Rock.—Situation remains about normal with market position steady and supply satisfactorily meeting the demand.

Superphosphate.—Price of normal has been increased in some spots to 86 cents per unit, but is still holding at 82 cents in the New York area. No change in price is suggested for triple.

Potash.—Demand is active for both domestic and foreign, and shipments against contracts continue to be heavy.

Charleston

May 10, 1952

In the Southeast demand for mixed fertilizers is rapidly tapering off, leaving manufacturers with virtually no inventories of raw materials. Hard nitrogen is fairly tight in supply. Potash is in fair supply relative to demand.

Organics.—Interest in fertilizer organics is primarily for the new season and domestic nitrogenous tankage is nominally $4.25 and $4.90 per unit of ammonia ($5.16 and $5.95 per unit N), bulk, f.o.b. production points. Imported nitrogenous tankage offerings are light at around $6.00 per unit of ammonia ($7.29 per unit N), in bags, c.i.f. Atlantic ports.

Castor Pomace.—Production continues limited and prices are at $37.25 per ton in burlap bags for domestic production, f.o.b. Northeastern production points. If shipment is in paper bags, $2.00 per ton allowance is made and material now being shipped is guaranteed 6.75 per cent ammonia.

Dried Blood.—Unground blood, in bulk, is indicated around $5.75 to $6.00 per unit of ammonia ($6.99 to $7.29 per unit N), f.o.b. Chicago area and $6.00 ($7.29 per unit N), f.o.b. New York area.

Potash.—Demand in the Southeast is light as the season nears its end. No change in prices of domestic material has been announced but it is understood domestic producers have made application to the O.P.S. for an increase. Stocks of imported material are fairly comfortable at the ports.

Ground Cotton Bur Ash.—Supplies of this source of carbonate of potash are available in fair quantity for prompt and future shipment. Material testing 40 per cent K_2O compares favorably with sulfate of potash delivered at most destinations.

Phosphate Rock.—Market continues steady with supply and demand in good balance. No change in prices has been announced.

Superphosphate.—Tailored ceiling prices for producing points have been recently announced by the O.P.S. Prices now are as follows for typical production points for normal grade superphosphate: Birmingham—85 cents; Jacksonville—78 cents; Atlanta—84 cents; Savannah—80 cents; Charleston—80 cents; Wilmington—81 cents; Cincinnati—98 cents; Baltimore—86 cents; Searsport, Me.—$1.03; Norfolk—85 cents; Memphis—95 cents; Kansas City—$1.08, etc.

Sulfate of Ammonia.—The tight supply position has not eased and demand prevents accumulation of stocks. Prices continue firm and unchanged.

Calcium Cyanamid.— American Cyanamid Company will reduce prices, effective May 15, as follows: granular grade will be $62.50 per ton and pulverized, $2.90 per unit of nitrogen, in bags, f.o.b. works, Niagara Falls, Canada.

Nitrate of Soda.—Arrivals are expected during the last week of May. Domestic suppliers are shipping from production.

Calcium Ammonium Nitrate.—Supplies of this imported form of ammonium nitrate testing 20.5 per cent N are currently arriving at Charleston and Wilmington at a price of $60.00 per ton, in bags, f.o.b. cars at the ports.


CHASE MULTIWALL PAPER BAGS
2-3-4-5 PLIES

Industrial News

New Products New Plants New Appointments

Shell Chemical Buys Hyman Co.

Continued manufacture of Aldrin and Dieldrin is assured by Shell Chemical corporation, which has completed arrangements to purchase the stock of Julius Hyman & company, of Colorado. Shell also gained exclusive world-wide rights to the farm chemicals in an agreement with Velsicol corporation, of Chicago.

Julius Hyman & company had manufactured the products since 1950, with Shell marketing them.

After lengthy litigation and legal arguments, Velsicol corporation was awarded patent rights to the pesticides on March 17.

To Keep Name

According to Jan Oostermeyer, president of Shell, Julius Hyman & company will continue operation under that name.

"We expect not only to continue production of Aldrin and Dieldrin," Oostermeyer stated, "but also to accelerate developments of new products."

Aldrin recently was accepted for registration by the USDA for control of rootworms and wireworms, which are among the worst foes of corn, peanuts, sugar beets and small grains.

Both Effective

Both chemicals have been proved especially effective against boll weevil and other damaging cotton insects. In addition, Dieldrin has been used successfully to control the alfalfa weevil.

An interesting application of Dieldrin was its use, last year, in fighting a devastating locust plague in Iran. Thirteen tons of the material were flown to Teheran under the ECA program to aid in the battle against the pests.

Named Vice President

Sydney T. Ellis

Expansion and development of Commercial Solvents corporation will be under the supervision of Sydney T. Ellis, newly appointed vice president.

Ellis has served as assistant to the president of the corporation during the past year, and will continue in that capacity. A chemical engineering graduate from Virginia Polytechnic Institute, Ellis has been associated with the chemical industry for 18 years.

He served with the Army Engineer Corps as a Lieutenant Colonel during World War II in the Pacific and C. B. I. theaters. He is a member of the Commercial Chemical Development Association and The American Chemical Society.

Freeport Production Up

Greatest production in its history was reported by Freeport Sulphur company for the first quarter of the year. Production was higher than in any quarter of the company's history, according to Langbourne M. Williams Jr., president.

Fertilizer Laws OK — Delaney

"The situation existing in the field of fertilizers does not reveal any need at this time for federal legislation."

That is the crux of the first section of a four or five part report from the Delaney committee.

Called the Select Committee to Investigate the Use of Chemicals in Food, the group titled the first report "Fertilizers."

"No reliable evidence was presented to indicate that the use of chemical fertilizers presents a hazard to man or animals," the report said in part.

Organics Important

Importance of using organic fertilizers was stressed by the committee. "It is the committee's opinion that more extensive research should be conducted to seek practical methods of conserving and utilizing various wastes and other organic matter for fertilizing purposes.

It is the committee's view that long term studies should be encouraged to determine:

1. Relative effect of chemical and organic fertilizers upon the nutritive value of crops and
2. Relationship of soils to human nutrition and health.

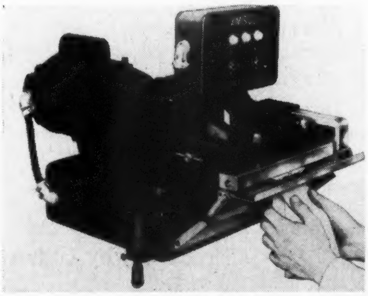
Series of Reports

The head of the committee, Rep. James J. Delaney (D-N. Y.), said the committee had decided upon the plan of submitting four or five reports in place of one large one because of the several major topics covered in the investigation. The committee was empowered to investigate the use of chemicals in food products, pesticides and fertilizer.

Hearings were held in New York, Chicago, San Francisco, Los Angeles, Seattle and Washington, D. C.

Industrial News

6-1 Heat Sealer



Amsco Sealing Machine

Perfect heat seals are guaranteed with a high speed jaw sealing machine recently developed by Amsco Packaging Machinery Inc.

All the essential features to insure perfect heat seals for small packages are included in the machine, according to the company.

Heat, pressure and time all are controlled automatically.

By using cartridge type hermetically sealed heating elements mounted in both sealing jaws, maximum heat penetration to inner sealing bag surfaces is achieved, Amsco states.

The machine can be used to seal small fertilizer or pesticide product packages.

Heat is controlled in the mechanism by a super-sensitive dial thermostat. The machine is equipped with an automatic folding bar which eliminates the necessity of the operator placing the bags between the jaws before sealing.

Spillage also is prevented by the folding bar, because bags are fed into the machine in a vertical position.

Crimp, flat or flat horizontal bead sealing surfaces are available with the machine. Special leveling plugs permit angling the sealing jaws for the most comfortable and efficient operating position. To get more information on the speed jaw sealing machine, fill out a **Reader Service** card, using number **6-1.**

Sulfur from Pyrites

Reports from Brazil state that French and German companies experimenting with Brazilian coal pyrites as a source of sulfur are having success.

The coal was shipped from Santa Catarina to experimental mills in France and Germany several months ago.

Norwegian Production

A substantial increase in production of nitrogen and fertilizers will be made by Norsk Hydro plant in Oslo, Norway.

The organization plans to spend 500 million crowns to increase production, according to the Norwegian Minister of Trade and Shipping.

Industrial News

Promoted by Powell

Douglas M. Malcolm Jr.

Douglas M. Malcolm Jr. has been appointed head of a regional sales office in Omaha for a new insecticide manufacturing plant constructed for John Powell & company.

Malcolm's territory includes North and South Dakota, Minnesota, Nebraska, Iowa, Kansas and Missouri.

Establishment of the Omaha plant is part of the decentralization plan of the Powell company. The plant will have special equipment for manufacture of parathion, DDT and 2, 4-D formulations, along with toxaphene and chlordane concentrates.

The products are used in midwestern states for control of corn borers, green bugs, grasshoppers and other pests.

Carl Schneider was appointed plant manager.

Production of Phosphate Up In French Territories

More than 8 million tons of phosphates may be produced in French overseas territories this year, according to French officials.

Production in all French overseas lands is up this year, according to the report, which states that the anticipated goal would approximate two million tons over North African output in 1950 and a million more than 1951.

Already started are plans for modernizing plants and methods in the territories.

Increased production is reported in Tunisia, Senegal and other African areas.

Increased Pesticide Need Is Predicted by USDA

A 9 per cent increase in need for pesticides during the 1951–52 crop year has been predicted by the USDA for farmers.

Total requirements, according to a USDA nation-wide survey, will be up from the previous year. The study was made under sponsorship of the Production and Marketing Administration.

Fifty-four chemicals were covered in the survey to determine the quantity of each estimated to have been used as pesticides during the crop year 1950–51 and estimated to be required for 1951–52.

Higher production goals, requested of farmers this year, doesn't mean use of all types of pesticides will increase according to the USDA. Conservation of certain basic materials, the Bureau reported, is reflected in the generally lower estimated requirements for pesticides containing these materials.

Requirements for pesticides used for many years remain relatively stable, according to the survey, while some of the newer materials will have big increases.

Sulphur Converting Corp. Plans Canadian Building

Plans to build a $5,000,000 sulfur plant at Roberval, Quebec, have been announced by Sulphur Converting corporation, a concern backed by European and Canadian capital.

The company has purchased land and plans to mine pyrite in the Chibougramau region. Sulfur will be processed from pyrite by a special process.

Industrial News

Following the bugs . . .

U. S. Pest Survey

This issue Farm Chemicals *initiates a monthly column in which latest pest survey information from federal and state units will be reviewed. Each month we will include most recent information available on insect conditions throughout the country, field populations, egg hatchings and new outbreaks.*

For the first time[1] the alfalfa weevil has been reported east of Neb., having been located in Anne Arundel and Baltimore counties, Md. The pea aphid has been found in abundance on alfalfa in Del., La., Md. and N. J. Heavy infestations on peas also have been noted in the Monroe, La. district.

Other news of special interest includes presence of red-banded leaf roller masses in N. J. and the lower Hudson Valley, N. Y. Codling moth pupation has been reported from southern Ind. and Ill. as well as western Ky.

Overwintered eggs of the European red mite have hatched in N. J. and southern Ind. and plum curculio development occurred earlier than usual in Fort Valley district of Ga.

Mexican bean beetle infestation has been found to be fairly heavy in southern Ga. and has appeared in the Charleston, S. C. area. The boll weevil was heavier than usual in the late spring in southern Tex. but its survival was lower than normal in La., N. C., S. C., Tenn. and Va.

A number of states report the presence of other insect pests, some in greater numbers than usual. Here's a brief round-up of the more important information received to date:

Grasshoppers — Big increase northwest of Casa Grande, Ariz. Populations of 75 in alfalfa, averaging 25 per square yard.

Egyptian alfalfa weevil—Moderate injury on clover and alfalfa in San Diego county, Cal. coastal area. Serious pest of alfalfa in Imperial Valley, Cal. for first time.

Greenbug — Fairly common in eastern Kan., scarce in western section. Heaviest Okla. infestations in central area.

Spittlebug — Meadow spittlebug on red clover and alfalfa in Del. and first hatching noted in Wayne county, O. Hatching over most of Md. where hay crops were being sprayed.

Armyworm—Some adults seen in Del., infestations on wheat near Charleston, S. C., feeding on vetch near Stoneville, Miss. and has been taken from oats at East Point, La.

Variegated cutworm—Abundant in wild winter peas and oats in Washington county, Miss. Unusual numbers in La. with severe damage to alfalfa, vetch, white clover and rough pea noted.

Brown wheat mite—Reported in Ford and Baylor counties, Tex. with some small grain fields destroyed or damaged. Light to moderate in Okla., serious injury in three Kan. counties. Also reported in other Kan. areas with considerable wheat damage near Aetna.

Sugarcane borer—Cool weather delayed emergence in Louisiana area.

Eastern tent caterpillar—Webs in Ga., Mass. and Miss. Believed more abundant than usual in central Ga.

Plum curculio—Adults in Del., Ga., Md. and N. J. Fully developed eggs found in females much earlier than usual in Ga. Increase in Ill.

Tarnished plant bug—Diminishing after heavy activity in Ind. Disappeared in southern Ill. Build-up of stink bugs noted.

Fruit aphids—Rosy apple aphid in Hudson Valley area and western

N. Y. Apple grain aphid hatched in Del., apple aphid and rosy apple aphid in N. J. Rusty plum aphid heavy on peach in east-central Ga.

Pear Psylla — Well distributed through pear section of southern Ore. Heavy egg laying in Hudson Valley and western N. Y.

Mexican bean beetle — Fairly heavy on snap beans in southern S. C. Light on beans in Poplarville, Miss. area.

Colorado potato beetle—Light in Charleston, S. C. area and Gainesville, Fla. Moderately heavy in southern Ga.

Wireworms—Injured 3–4 per cent of tubers in Charleston, S. C. area.

Cabbage caterpillars—Diamond-back moth light to moderate, imported cabbageworm and cabbage looper light in Charleston, S. C. area. Imported cabbage worm adults heavy in Pike and Walthall counties, Miss. Larvae noted in Stoneville, Miss. area.

Pink bollworm — Record early season bloom infestations in Lower Rio Grande valley, Tex. Found in 35 Tex. counties.

Seed-corn maggot — On Ga. cotton seedlings. Destroyed planted cotton and lima bean seeds in three Miss. counties.

Screwworm—Survival noted over wider Tex. area than usual. Natural migration of flies underway. No evidence of flies in N. Mex. but overwintering adults found in Yuma county, Ariz. and three Calif. counties.

A report from Delaware received just prior to press time announces presence of the alfalfa weevil in that state. A number of adults were collected through routine survey work. It is not known whether the pest entered the state in imported hay or is an extension of the Maryland infestation.

Stricter Conservation Is Requested for Sulfur

An even stricter program of sulfur conservation has been urged as a necessity by the National Production Authority. The NPA emphasized this at a meeting with the phosphatic fertilizers industry advisory committee.

An increase of 75 per cent in superphosphate production over the present yearly total — the USDA's goal for 1955 — makes greater conservation efforts necessary, NPA pointed out. This year approximately 2,000,000 tons of super will be produced. USDA wants 3,485,000 three years from now.

Methods for conserving sulfuric acid were explained by representatives of the Tennessee Valley Authority and the USDA who described the process of producing superphosphate by treating phosphate rock with nitric acid.

International Paper COMPANY

BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston Chicago • Cleveland • Denver • Detroit • Kansas City Kansas • Los Angeles New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

Industrial News

Mexican Fertilizer Production to Rise

Mexico will increase its production of fertilizer by at least 100 per cent through the recently created Guanos & Fertilizers of Mexico, created under the auspices of Nacional Financiera, semi-official government financing agency.

The new organization has worked out and will apply a carefully elaborated plan which has for its chief purpose duplication of output of diverse plants now functioning. Fertilizer manufacturers, although they now are working around the clock, cannot fully meet the demands of the nation now embarked on an ambitious agricultural development program.

Increasing Capacity

Major step being undertaken is increasing the capacity of plants which Guanos & Fertilizers of Mexico controls in Villa de Guadelupe (a suburb of Mexico City), San Luis Potosi and Guadalajara. The latter plant produces synthetic sulfate of ammonia and is the first of its type in Latin America.

The Cuautitlán plant, erected at a cost of 76 million pesos (approximately \$8,794,440) uses the most advanced manufacturing procedures and is said to be one of the most modern and best operated plants in all the Spanish speaking countries.

Plant Production

The plant, operating at full capacity, produces 200 metric tons of sulfate of ammonium daily, from which is produced 50 tons of anhydrous ammonia and about 200 tons daily of sulfuric acid.

Plant capacity at Cuautitlán is to be increased and new units are to be erected. The managing director of Guanos & Fertilizers of Mexico, Eduardo Luque Diaz, recently came to the United States in the double capacity of representative of Nacional Financiera and head of the fertilizer industry, with the object of petitioning for credits from Eximbank.

The money sought will be used for expansion projects of the Mexican fertilizer industry.

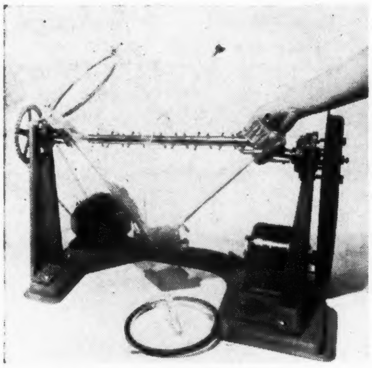
Diaz brought with him a complete report showing the heavy needs for fertilizer in Mexico so that the agricultural program can go ahead unhampered, and the detailed industry expansion program planned to meet the country's needs.

During his stay in the United States Diaz will visit Washington, the Tennessee Valley and El Dorado, Ark. In addition to seeking credits he will tour U. S. agricultural centers to study recent advanced developments.


Model depicted here is the original paper bag "tubing" machine on which James Arkell obtained patents. This, and Arkell's original "bottomer" are the two basic machines after which all modern paper bag making machines have been patterned.
General view of the modern A. & S. Mobile plant where up to six plies of Kraft paper can be tubed in one operation with the outer ply colorfully printed on high speed 4-color presses.
ARKELL and SMITHS
CANAJOHARIE, N. Y. WELLSBURG, W. VA.
THE OLDEST NAME IN PAPER BAGS
ARKELL & SMITHS
A&S
THE OLDEST NAME IN PAPER BAGS

Industrial News

6-2 Patterson-Kelley Blender



Patterson-Kelley Blender

Processing industries, particularly pesticide and fertilizer, can profit by a new blender designed by Patterson-Kelley company, according to a description of the new product.

The company says its new Twin-Shell Blender with a rotating "Intensifier Bar" is especially adapted to the processing industries.

The lug-studded bar improves mixing action by effectively breaking up lumps, dispersing materials which tend to agglomerate and homogenizing liquids into solid mixes, it is claimed.

Here's how the blender works: The intensifier bar is so located that the cylindrical lugs act only on the top layer of the material being mixed. Rotation of the blender continuously supplies fresh material to the impact and shearing action of the lugs, the peripheral speed of which is approximately 2500 feet a minute.

A separate motor drives the metal bar, according to Patterson-Kelley. Power requirements are small because the bar acts only on the top layer of material being blended. The bar can easily be removed for cleaning.

For further data on the Twin-Shell Blender, fill out a **Reader Service** card, using number **6-2.**

Westvaco Chemical Forms Mineral Development Unit

Westvaco Chemical division of Food Machinery and Chemical corporation has formed a mineral development department with headquarters at Pocatello, Ida., to develop mineral resources of that area.

Westvaco already uses large amounts of phosphate shale from the Fort Hall deposits for phosphorus production near Pocatello. The new department will be managed by O. A. Power, formerly manager of the J. R. Simplot Fertilizer company. Geologists H. B. Fowler, Ace Allen and W. C. Peters, and mining engineers E. L. Spencer and W. A. Young will assist him.

DPA Announces Three Chemical Expansion Goals

Three insecticide expansion goals have been announced by the Defense Production Administration.

DDT production is scheduled to be increased to 155 million pounds, by Jan. 1, 1955, 53 million more than Jan. 1, 1951.

Lindane, which had only small production by one company in 1951, will have total production of 5,120,000 by 1955, according to DPA predictions.

The third chemical, BHC, has a goal of 23.7 million pounds, an expansion of 53 million pounds over the 1951 level.

Scientists Decry 'False Claims' Against Pesticides

Scientists at recent American Chemical Society meetings in Milwaukee decried false claims about the supposed dangers of pesticidal residues to public health.

Public hysteria often is caused by the claims, the speakers asserted. Such a situation can only result in limiting or preventing use of valuable pesticides with no gain to public health.

Studies were presented to show that most insecticide residues disappear before food reaches the public. Very toxic pesticides normally dissipate quickly, it was reported.

Industrial News

'Nurish' Director

Introduction of NACO Fertilizer company's new liquid plant concentrate Nurish is being directed by Frank Colvan.

Colvan joined the industrial de-

Frank Colvan

partment of W. R. Grace & company, which owns NACO, in 1950.

He was appointed a vice president last month to direct the Nurish campaign. His headquarters are at the NACO executive office in Charlestown, S. C.

Colvan is a native of Ypsilanti, Mich., and was graduated from Northwestern University.

A test mail order campaign of Nurish, a 20–20–20 soluble fertilizer, has been started on the West Coast.

Oklahoma Fertilizer Starts Construction of Big Plant

Building has started at Oklahoma City on the state's largest fertilizer factory by the Oklahoma Fertilizer company.

C. C. Crawford, vice president and general manager of the firm, announced the $300,000 plant will go into operation about July 1 with production set at 20,000 tons of fertilizer the first year. Plant capacity will be 50,000 tons.

Crawford said the plant will be an A-frame wood structure with an adjoining processing area. The market area will cover a 200 to 250 mile radius of Oklahoma City.

Both superphosphate and mixed fertilizer will be produced.

Lester E. Cox, Springfield, Mo., president of Modern Tractor and Supply company, is president of the new firm. Crawford, president of Sunset Fertilizer company, Bartlesville, Okla., and J. M. Griffin, vice president and general manager of Modern Tractor, will operate the plant. The latter will be secretary-treasurer.

Fertilizer Sales Rise, Tax Tag Sales Indicate

A 10,000 ton increase in equivalent fertilizer sales was indicated in the report of February tax tag sales and reports of shipments.

According to compilations by the National Fertilizer Association, total for the month was 858,000 tons of fertilizer, compared to 848,000 for the same month in 1951.

The association also reported that tax tag sales for the first seven months of the fertilizer year are down 10 per cent from the same period last year. Tag sales and reports of shipments for the period July-January, 1951-52, were 4,360,000 short tons compared to 4,772,000 tons for the same portion of the 1950-51 crop year.

How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. *Fill out one quarter section for each item in which you are interested.*

6-4 Johnson Blending Plants

Slow, costly manual methods of fertilizer mixing can be eliminated with Johnson fertilizer blending plants, the C. S. Johnson company reports. Their plants include bucket elevator, clod breaker, separating screen, collecting hopper and other equipment necessary for complete and efficient mixing and blending of fertilizers, information from the company explains. **Code Number 6-4.**

6-5 Warfarin Available

Warfarin, the potent rodenticide that is having so much success on farms throughout the country, is available in bulk for repackaging or for further manufacture as ready-to-use baits, according to Prentiss Drug and Chemical company, Inc. The company also has a free booklet giving technical data on Warfarin and describing its action in controlling rats and mice. **Code Number 6-5.**

6-6 Cluster Hoppers

Savings in money and labor and increase in production speeds can be assured by using Davidson-Kennedy company Cluster Hoppers, the company says in recent literature on the product. Capacity can be increased by 50 per cent with the hoppers, a booklet states. Davidson-Kennedy also manufactures a complete line of fertilizer equipment. Using the hoppers, the company claims, normal operation calls for only four men—two on load trucks, one on a swivel chute and one man weighing the material. **Code Number 6-6.**

6-7 Hammond Bags

Constant research and improvements in paper bag construction are being conducted by Hammond Bag and Paper company. Now the company has prepared a booklet of special value to

Here is a list of the NEW PRODUCTS and BULLETINS described on this and the Industrial News pages of this issue giving their monthly code number.

- **6-1** Heat Sealer
- **6-2** Patterson-Kelley Blender
- **6-3** Conveyor System
- **6-4** Johnson Blending Plants
- **6-5** Warfarin Available
- **6-6** Cluster Hoppers
- **6-7** Hammond Bags
- **6-8** Pyrax ABB
- **6-9** Atlox Agents
- **6-10** Fertilizer Borate
- **6-11** Package Evaluator
- **6-12** Tri-Excel
- **6-13** Niran
- **6-14** Cooper Emulsifiers
- **6-15** Nacconol
- **6-16** Raymond Pulverizer

FILL OUT READER SERVICE CARDS

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Companv............
....
Co. Address............
.... 52-

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
....

FARM CHEMICALS Code Number
Name............
Title............
Company............
....
Co. Address............
.... 52-

personnel in the fertilizer and pesticide fields. It's called "To Serve You Better with Hammond Multi-Wall Bags," and describes the company's line of bags for all purposes. **Code Number 6-7.**

6-8 Pyrax ABB

There is no waste of dusting pesticides when Pyrax ABB pyrophyllite diluent is used, according to information on the product from R. T. Vanderbilt company. Technical information on Pyrax ABB, available from the company, describes it as well adapted for aircraft dusting. It adheres electrostatically even to the dry underside of foliage, is nonhygroscopic and chemically inert, according to the bulletin on the product, Hence, less toxicant can be used and dusts can be stored from year to year when this material is used. **Code Number 6-8.**

6-9 Atlox Agents

"Atlox Surface Active Agents for Forumlating Agricultural Chemicals" is the title of a new booklet offered by Atlas Powder company. The booklet provides formula, testing methods and other information vital to the industry. The agents are used for every type of toxicant, emulsifiable or oil-diluted concentrates for any sprayer, the company states. The agents are virtually chemically inert. **Code Number 6-9.**

6-10 Fertilizer Borate

Especially developed for the fertilizer industry—featuring higher analysis and lower cost—Pacific Coast Borax company has literature on a product that can save fertilizer plants lots of money. The product is High Grade Fertilizer Borate. It contains approximately 12 per cent Borax equivalent and only 82.9 pounds of the material is needed for each 100 pounds of Borax guaranteed, according to the company. **Code Number 6-10.**

6-11 Package Evaluator

It's quite easy to have more packaging than you need, the Union Bag and Paper corporation states, in offering a new "Chemical Package Evaluator." The company says Chem-Pak bags provide the kinds of protection most chemical products require. **Code Number 6-11.**

FIRST CLASS
PERMIT No. 386
Sec. 510 P. L. & R.
Philadelphia, Pa.

BUSINESS REPLY CARD
No Postage Necessary if Mailed in the United States

Postage Will Be Paid By

FARM CHEMICALS
317 North Broad Street
Philadelphia 7, PA.

FIRST CLASS
PERMIT No. 386
Sec. 510, P. L. & R.
Philadelphia, Pa.

BUSINESS REPLY CARD
No Postage Necessary if Mailed in the United States

Postage Will Be Paid By

FARM CHEMICALS
317 North Broad Street
Philadelphia 7, Pa.

FILL OUT READER SERVICE CARDS

6-12 Tri-Excel

"Tri-Excel" dust concentrate has been proved excellent for control of the Mexican Bean bettle. Information on the concentrate, which contains rotenone, pyrethrins and n-propyl isome, is available from S. B. Penick & company. The product also is outstanding for a large variety of truck crop pests. **Code Number 6-12.**

6-13 Niran

Information on their new Parathion product now is available from Monsanto Chemical company. A new company bulletin describes "Niran," the new material containing Parathion. The company also has available wall posters telling how to handle the pesticide material safely. **Code Number 6-13.**

6-14 Cooper Emulsifiers

Pesticide formulators can save 25-50 per cent of their emulsifier costs and improve their insecticide formulations by using Cooper Emulsifiers, according to literature from William Cooper & Nephews, Inc. The company has free samples of their emulsifiers available along with complete information on the product. The material works in hard or soft water with aliphatic or aromatic solvents. **Code Number 6-14.**

6-15 Nacconol

If you want to boost the killing power of the toxic agents in your pesticide formula, you ought to consider using Nacconol, a new wetting agent manufactured by National Aniline Division of Allied Chemical and Dye corporation. The division says samples, process and suggestions for use of the product now are available. **Code Number 6-15.**

6-16 Raymond Pulverizer

Virtually all major types of insecticide formulations can be obtained by using a Raymond pulverizer, according to literature of the pulverizer division of Combustion Engineering-Superheater, Inc. Equipment of the company can be used for producing blended field strength insecticides including DDT, Toxaphene, Chlordane and others. The pulverizing equipment is available in all types for insecticide processing, the company states in a bulletin. **Code Number 6-16.**

TC
TENNESSEE CORPORATION

TRIPLE SUPERPHOSPHATE

46 to 48% Available Phosphoric Acid

A MARK OF FLORIDA TRIPLE PHOSPHATE RELIABILITY

20% SUPERPHOSPHATE

Sales Agents: Bradley & Baker
155 East 44th St. New York, N. Y.

•

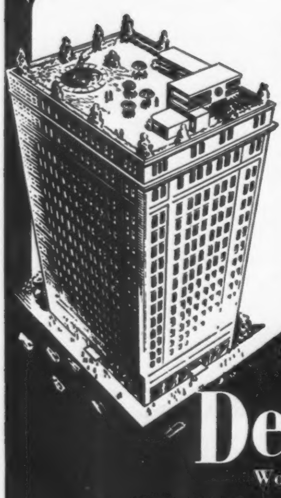
U. S. Phosphoric Products

Division

TENNESSEE CORPORATION

Tampa, Florida

Detroit's Leading Commercial Hotel

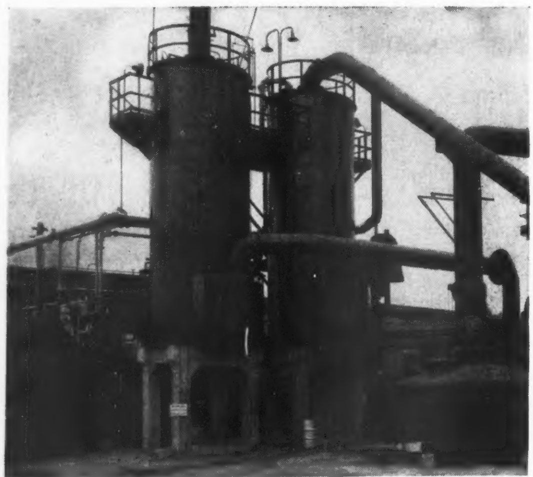


Stay at the newest, most centrally located hotel in the Motor City, completely fireproof, 750 outside rooms with bath, smart new furnishings, lowest comparable rates, ample parking space—a find for the cost-conscious traveler! *Dining Rooms Air Conditioned*

The NEW Hotel Detroiter

Woodward at Adelaide

Convention and Touring Groups Invited



Serving the free world

Monsanto-designed sulfuric acid plants now are producing approximately 40 per cent of the free world's contact sulfuric acid. There are more than 300 of these efficient, economical plants, operating in 26 countries around the globe. Monsanto-designed plants, employing Monsanto Vanadium Catalyst, do not depend upon elemental sulfur alone, but work with all known raw materials. Monsanto designs, having many exclusive features, are based on more than 30 years' experience in sulfuric acid plant design, construction and operation. If you are considering a sulfuric acid plant for the future, you are invited to discuss your problems with Monsanto engineers. Their counsel costs you nothing . . . puts you under no obligation.
MONSANTO CHEMICAL COMPANY,
Engineering Sales Department,
1700 South Second Street, St. Louis 4, Mo.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

AGRICULTURAL CONSULTANTS
Bailey & Lerch, Washington, D. C.

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

AMMONIA—Anhydrous and Liquor
Barrett Div., Allied Chemical & Dye Corp., N. Y. C.
Commercial Solvents Corp., New York City
Lion Oil Co., El Dorado, Ark.
Mathieson Chem. Corp., Baltimore, Md.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE
See Sulfate of Ammonia

BAGS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Multiwall-Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co., Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
Fischbein Co., Dave, Minneapolis, Minn.
International Paper Co., Bagpak Div., N. Y. C.

BAG CLOSING—THREAD & TWINE
Bemis Bros. Bag Co., St. Louis, Mo.
Mente & Co., Inc., New Orleans, La.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga..
Commercial Solvents Corp., New York City
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.
Hayward Company, The, New York City

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Phelps Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.

DILAN
Commercial Solvents Corp., New York City

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.

DITHIOCARBAMATES
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS—Bucket
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., N. Y. C.
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporation, Nicolay, New York City

FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FILLERS
McIver & Son, Alex. M., Charleston, S. C.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Tennessee Corp., Atlanta, Ga.

HERBICIDES
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.

HERBICIDES—Oils
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Carnegie Chemical Mfg. Co., Los Angeles, Cal.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., N. Y. C.
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corp., New York City
Milligan Bros., Jefferson, Iowa
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Powell & Co., John, New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon
Sackett & Sons Co., The A. J., Baltimore, Md.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MANGANESE SULFATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, New York City

MINOR ELEMENTS
Andrews Sales, Inc., W. R. E., Philadelphia, Pa.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF SODA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Barrett Div., Allied Chemical & Dye Corp., N. Y. C.
Carnegie Chemical Mfg. Co., Los Angeles, Cal.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGEN MATERIALS—Organic
American Agriculture Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

PHOSPHATE ROCK
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
General Industrial Development Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporation Nicolay, New York City

POTASH—Muriate
American Potash & Chemical Corp., N. Y. C.
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, New York City
Southwest Potash Corp., New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, New York City

POTASSIUM PHOSPHATE
Monsanto Chemical Co., St. Louis, Mo.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SACKING UNITS
Sackett & Sons Co., The A. J., Baltimore, Md.

SCALES—Including Automatic Baggers
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SOIL TESTING APPARATUS
La Motte Chemical Products Co., Baltimore, Md.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

STORAGE BUILDINGS
Marietta Concrete Corporation, Marietta, Ohio

SULFATE OF AMMONIA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Div., Allied Chemical & Dye Corp., N. Y. C.
Jackle, Frank R., New York City
Koppers Co., Inc.,Tar Products Div. Pittsburgh, Pa.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Texas Gulf Sulphur Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TEPP
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.

2, 4-D
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

2, 4, 5-T
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.

UREA & UREA PRODUCTS
Carnegie Chemical Mfg. Co., Los Angeles, Cal.
Barrett Div., Allied Chemical & Dye Corp., N. Y. C.

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

Alphabetical List of Advertisers

Is U. S. losing out?

Mexico Seeks Own Pesticides

ARE United States manufacturers going to lose out on the foreign farm chemicals market?

That question is spurred by some rather startling news FARM CHEMICALS received from a Mexican correspondent this month.

It has been estimated that Mexico annually buys more than $11,574,000 worth of insecticides, chiefly from the United States.

Now a movement has been initiated by Mexican agricultural leaders to assure production of insecticides within the country in quantities sufficient for domestic needs.

Leaders in the drive, according to the report, are cotton growers and farmers of the Lagunera district who alone consume approximately $6,944,000 of imported pesticides each year.

Two Reasons for Move

Two reasons are given for the Mexican move to produce pesticides within the country:

1. High cost of American products. Mexican officials point out that cheaper insecticides can be produced very easily in that country because there are adequate supplies of basic prime materials and salaries paid to workers are low.

2. An unhealthy situation in regard to pesticides has existed for a long time, according to officials. Certain products such as sulfur and turpentine have been exported to be returned as transformed insecticide products.

The charge is made, however, that Mexican farmers must pay five times as much for the finished product as for the prime materials. Agricultural credit groups and large farm operators long have been impatient with this "unjust" overcharging for insecticides, and would prefer to obtain supplies from within the country.

Discussing high cost of cultivation in Mexico, a spokesman for Torreon Agriculture and Livestock chamber pointed out that a minimum annual investment of $20.40 is required for insecticides for each acre cultivated, with labor for spraying coming to $2.80.

'Extraordinarily High' Costs

The Chamber claims these figures are "extraordinarily high" and says cotton growers of the region will provide financial aid for construction of an insecticide plant if studies now under way in Mexico City indicate such a project would pay its way.

Studying the problem are the Mexican Institute of Technological Investigations, working under a grant from the Bank of Mexico and Nacional Financiera, and the National Laboratories for Industrial Development.

Meanwhile, experiments are being conducted in Mexico City on development of chlorine insecticides from native forest products.

End